Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:19 AM
To: Pearce, Jennifer
Subject: FW: Dept of the Interior letter to the National Remedy Review Board re Anniston PCB Site OU1/OU2
Attachments: 04-15-2016 FWS letter to Legare_EPA.pdf; 03-28-2013 Letter to Scully.pdf; 07-08-2013 FWS comment letter_SERA.pdf; 10-08-2015 signed letter to Scully.pdf; Letter to EPA with comments on RI, etc.pdf; May 7, 2015 Trustee Comments to EPA with Appendices.pdf

From: Scully, Pam
Sent: Monday, June 13, 2016 7:03 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: Dept of the Interior letter to the National Remedy Review Board re Anniston PCB Site OU1/OU2

From: Legare, Amy
Sent: Tuesday, April 19, 2016 1:43 PM
To: Scully, Pam
Subject: FW: Dept of the Interior letter to the National Remedy Review Board re Anniston PCB Site OU1/OU2

From: Marlowe, Karen [mailto:karen_marlowe@fws.gov]
Sent: Friday, April 15, 2016 12:30 PM
To: Legare, Amy <Legare.Amy@epa.gov>
Subject: Dept of the Interior letter to the National Remedy Review Board re Anniston PCB Site OU1/OU2

Ms. Legare,

I am attaching the Department of the Interior's April 15, 2016, letter with attachments for consideration by the National Remedy Review Board.

Sincerely,

Karen Marlowe
Alabama Field Office-Birmingham Suboffice
800 Lakeshore Dr., Rm. 229 Propst Hall
Birmingham, AL 35229-2234
205-726-2667 (ph)
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
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IN REPLY REFER TO

APR 15 2016

Amy Legare
National Remedy Review Board
US EPA
1200 Pennsylvania Ave., NW MC5204P
Washington, DC 20460

Dear Ms. Legare:

The U.S. Department of the Interior (USDOI) appreciates the opportunity to provide input to the National Remedy Review Board (NRRB) on the Streamlined Ecological Risk Assessment (SERA) and Remedial Investigation Report (RI) for Operable Unit 1/Operable Unit 2 (OU1/OU2) of the Anniston PCB Site. The documents under review were submitted to the U.S. Environmental Protection Agency (USEPA) by the Responsible Party (RP; Pharmacia LLC and Solutia Inc.) to support risk management decisions for the OU1/OU2 portion of the Anniston PCB Site, which is located in Anniston, Alabama. We strongly recommend against relying on the results of the RI to support risk management decisions for the OU1/OU2 portion of the Anniston PCB Site, based on the reasons provided in our previous comment letters to the USEPA (letters dated March 28, 2013, April 16, 2013, July 8, 2013, May 7, 2015, and October 8, 2015 – attached), and as summarized below:

- Only a streamlined ERA (SERA) was conducted to assess risks to ecological receptors associated with exposure to contaminated environmental media in the OU-1/OU-2 portion of the Anniston PCB Site. The rationale for not conducting a full baseline ERA (BERA) is unconvincing considering the diversity of ecological receptors that utilize aquatic and riparian habitats in the Upper Snow Creek watershed.

- The Conceptual Site Model (CSM) for the OU-1/OU-2 portion of the Anniston PCB Site is incomplete for several reasons. First, floodplain soils are not identified as a source of chemicals of potential concern (COPCs) or as a primary exposure pathway, despite ample data that demonstrate that floodplain soils are contaminated by PCBs and other COPCs. In addition, numerous complete exposure pathways were not evaluated because they were subjectively classified as "minimal relative to the identified primary complete pathways."

- The list of assessment endpoints that were evaluated is incomplete, resulting in an incomplete assessment of risks to ecological receptors.

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- The list of measurement endpoints that were evaluated is incomplete. In addition to the challenge that the missing assessment endpoints creates, certain types of data (i.e., lines-of-evidence; LOEs) that are relevant for assessing risks to ecological receptors were not incorporated into the assessment (e.g., riparian soil chemistry).

- The assumptions used in the exposure assessment tend to minimize exposure point concentrations for PCBs and other COPCs. For example, the SERA assumed that there is no exposure to floodplain soils within OU-1/OU-2. Because floodplain soils are known to be contaminated by PCBs and other COPCs, risks to ecological receptors that are exposed to floodplain soils were necessarily underestimated. In addition, sediment chemistry data for the 0-2" sediment horizon was selected to evaluate risks to benthic invertebrates. However, benthic invertebrates commonly utilize habitats deeper in the sediment matrix (i.e., to depths of 6" or deeper). As the concentrations of PCBs and other COPCs are frequently substantially higher in deeper sediments compared to the 0-2" depth, the exposure assumption results in an underestimation of risks to benthic invertebrates.

- The list of COPCs that were evaluated is incomplete. Key COPCs that are known to occur at the site and that are known to occur at elevated levels in OU-1/OU-2 sediments and/or floodplain soils include: arsenic, copper, zinc, PAHs, aldrin, dieldrin, and heptachlor epoxide.

- The nature and extent of contamination was evaluated only for PCBs.

- The toxicity reference values that were selected for evaluating risks to ecological receptors are frequently inappropriately high. For example, the tissue residue values (TRVs) that were selected for evaluating risks to benthic invertebrates ranged from 4.43 to 14.3 mg/kg DW for total PCBs. By comparison, the U.S. Geological Survey (USGS; Ingersoll *et al.* 2014) reported site-specific toxicity thresholds on the order of 0.5 mg/kg DW. Application of the inappropriately high TRVs for assessing risks to benthic invertebrates exposed to OU-1/OU-2 sediments results in an underestimation of risks to these key ecological receptors.

- The additive effects on ecological receptors associated with exposure to PCBs, polychlorinated dibenzo-p-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs) were not evaluated. This represents a major shortcoming of the assessment because all three groups of COPCs occur at elevated levels in environmental media and these substances have the same or similar modes of toxicity.

- The ERA concluded that aquatic and riparian habitats located within the OU-1/OU-2 portion of the Anniston PCB Site do not support aquatic-dependent wildlife species, but provide no references or surveys to support this assumption. Therefore, conclusions indicating that wildlife risks are low due to negligible use of such habitats are unreliable.

As summarized above and discussed at length in the attached comment letters, the USDOI believes there are numerous limitations within the SERA that result in underestimation of risks to ecological receptors utilizing aquatic and/or riparian habitats within OU-1/OU-2. Accordingly, USDOI disagrees with many of the conclusions that were reached regarding the nature and extent of contamination, fate and transport of COPCs, and risks to ecological receptors.

Thank you for the opportunity to provide these comments for your consideration. If you have any questions, please feel free to contact me (205/726-2667; Karen_marlowe@fws.gov).

Sincerely,

Karen W Marlowe

Karen W. Marlowe
Case Manager
Anniston PCB NRDAR Case Manager

Attachments

Reference:

Ingersoll CG, Steevens JA, MacDonald DD, eds. 2014. Evaluation of toxicity to the amphipod, Hyalella azteca, and to the midge, Chironomus dilutus; and bioaccumulation by the oligochaete, Lumbriculus variegatus, with exposure to PCB-contaminated sediments from Anniston, Alabama: U.S. Geological Survey Scientific Investigations Report 2013–5125, http://pubs.usgs.gov/sir/2013/5125.

United States Department of the Interior

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IN REPLY REFER TO

MAR 2 8 2013

Pamela J. Langston Scully
Remedial Project Manager
Superfund Remedial Branch
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Scully:

Thank you for the opportunity to review the ***Streamlined Ecological Risk Assessment for the OU-1/OU-2 portion of Snow Creek, Anniston PCB Site, Anniston, Alabama***, that was prepared by Arcadis (2013) on behalf of Pharmacia LLC and Solutia Inc. (P/S; dated February 2013). The U.S. Department of the Interior (USDOI) also appreciates the opportunity to review the Remedial Investigation Report for Operable Unit 1/Operable Unit 2 of the Anniston PCB Site, Anniston, Alabama, that was prepared by ENVIRON International Corporation (2013) on behalf of Solutia, Inc.

Based on the results of this review, USDOI has a number of concerns about the streamlined ecological risk assessment (SERA) as proposed by P/S. In general, as proposed, the SERA inappropriately narrows the scope of the investigation to evaluate risks to the ecological receptors that utilize or could utilize aquatic and riparian habitats in the OU-1/OU-2 portion of Snow Creek. Also, it appears that the proposed SERA relies on incorrect or somewhat mischaracterized data interpretation to reach some of the conclusions in the type and extent of evaluations that are needed. Therefore, the results of the SERA should not be incorporated into the remedial investigation (RI) for OU-1/OU-2 of the Anniston PCB Site and should not be used to guide decisions related to the feasibility study (FS). The comments prepared by USDOI on the technical approaches that were used in the SERA for OU-1/OU-2 and on the results of the SERA are attached to this letter. Because the RI report relies on the SERA and because the SERA will require substantial revision, USDOI believes that it is premature to conduct a comprehensive review of the RI report at this time. While the USDOI appreciates the desire to make progress on the remediation of the Anniston PCB Site, the proposed SERA does not provide sufficient information on the risk to the environment in order to make informed decisions about remediation. The USDOI looks forward to reviewing a revised SERA, and other corresponding documents in the future.

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If you have any questions concerning the attached comments or wish to meet to further discuss our concerns, please feel free to contact me (205/726-2667; Karen_Marlowe@fws.gov).

Sincerely,

Karen W. Marlowe

Karen W. Marlowe
Anniston PCB NRDAR Case Manager

Enclosure

cc: Amy Horner, DOI-Solicitor, Washington, D.C.
Diane Beeman, USFWS NRDAR Coordinator, Atlanta, GA
Will Brantley, ADCNR, Montgomery, AL
Marlon Cook, GSA, Tuscaloosa, AL
Will Gunter, General Counsel, ADCNR, Montgomery AL
Bennett Bearden, Assistant Attorney General, GSA, Tuscaloosa, AL
Bill Weinischke, DOJ, Washington, D.C.
Davis Forsythe, DOJ, Denver, CO
Rudy Tanasijevich, EPA Solicitor, Atlanta, GA

1.0 Comments on the Rationale for Conducting a Streamlined Ecological Risk Assessment for OU-1/OU-2

According to the U.S. Environmental Protection Agency (USEPA) comments (MacDonald and Moore 2004) on the RI/FS Work Plan (BBL 2004), risks to ecological receptors associated with exposure to chemicals of potential concern (COPCs) within OU-1/OU-2 would be evaluated in the baseline ERA (BERA) for OU-4. Based on the information presented in Arcadis (2013), P/S petitioned USEPA in November 2012 for the ERA for OU-1/OU-2 to proceed in advance of the BERA for OU-4 and this request was approved by USEPA in November 2012. The rationale for proceeding with a SERA of OU-1/OU-2 was that the "highly disturbed nature of Upper Snow Creek rendered habitat, human activity, water quality, and general disturbance as critical constraints."

While USEPA approved Solutia Inc.'s request to conduct a SERA of OU-1/OU-2, it is important to note that USDOI was not informed about the P/S request to modify the approved RI/FS Work Plan and comments on the request were not solicited from USDOI at the time that the decision was made by USEPA. While it is correct that habitat values in the Snow Creek watershed may be lower than habitat values in other areas within the Choccolocco Creek basin, USDOI understands that important aquatic and riparian habitats exist within the Snow Creek watershed upstream of Highway 78. As such, it is appropriate to conduct a BERA for this portion of the study area, in conjunction with the BERA for OU-4, as was originally agreed to when the RI/FS Work Plan was approved.

2.0 General Comments on the Streamlined Ecological Risk Assessment for OU-1/OU-2

According to Arcadis (2013), the purpose of the SERA is to evaluate the likelihood of effects on sustainability of local receptor populations that may reside or forage in the OU-1/OU-2 portion of Snow Creek. The USDOI comments on the technical approach that was used in the SERA and the associated results are summarized in the following sections of this document.

- Section 1.1; Page 1-2: The purpose of the SERA is not correctly stated: the concept of "sustainability" inappropriately narrows the investigation to be performed under the SERA as does the focus on "local receptor populations." Rather, the purpose of the SERA should be to "evaluate the likelihood that adverse ecological effects are occurring or may occur as a result of exposure to chemicals of potential concern in the OU-1/OU-2 portion of Snow Creek." Such wording is consistent with the Ecological Risk Assessment Guidance for Superfund that was issued by USEPA (1997).

- Section 1.1; Page 1-2: This section of the document indicates that the SERA does not evaluate floodplain or terrestrial areas within OU-1/OU-2 and focuses on receptors that

may be exposed in the aquatic portion of Snow Creek. While P/S may have an interest in limiting the scope of the study area and receptors that are addressed in the SERA, the ERA must, at minimum, evaluate those areas where COPCs from the Facility have come to be located (i.e., in accordance with the Partial Consent Decree) and those ecological receptors that occur or may occur in aquatic or floodplain habitats within OU-1/OU-2. Therefore, the scope of the SERA, as defined by Arcadis (2013), is too narrow and the SERA may not capture enough information to adequately characterize risk posed to the environment by the COPCs.

- Section 2.1; Page 2-1 to 2-2: This section of the document describes the ecological setting in the study area. While the results of habitat surveys conducted in the study area indicated that aquatic and terrestrial habitats were not optimum, this section of the document acknowledges that aquatic and riparian habitats in Upper Snow Creek are utilized by a diversity of ecological receptors, including aquatic plants, aquatic invertebrates, crustaceans, fish, amphibians, reptiles, birds, and mammals. Therefore, USDOI does not agree that issues related to habitat quality provide the necessary and sufficient rationale for conducting the SERA (i.e., instead of conducting a more robust BERA). Habitats within the Upper Snow Creek watershed provide important habitat values and cannot be written off by P/S or USEPA.

- Section 2.2; Pages 2-2 to 2-3: This section of the document indicates that PCBs, barium, chromium, cobalt, lead, manganese, mercury, nickel, vanadium, and PCDDP/SCDFs were carried through the SERA (at the request of USEPA). While USDOI agrees that these COPCs need to be addressed in the SERA, this list of COPCs is incomplete (see USEPA comments on the Anniston PCB Site - COPC Evaluation White Paper; Arcadis 2012. Detailed comments from USDOI that were attached to USEPA comments and that P/S needed to address during COPC refinement are attached as Appendix 1). For floodplain soils, arsenic, PAHs, aldrin, dieldrin, and heptachlor epoxide frequently exceeded screening-level tissue residue values (TRVs) and, hence, should be carried forward into the SERA. In addition, the concentrations of arsenic, copper, zinc, PAHs, and numerous organochlorine pesticides exceeded screening-level TRVs in sediments and, hence, should be carried forward into the SERA. Failure to consider all of the COPCs that occur in sediments or floodplain soils at levels sufficient to pose potential risks to ecological receptors renders the resultant SERA unreliable.

- Section 2.3; Pages 2-3 to 2-4: This section of the document describes the conceptual site model (CSM) that was developed for the site. This section of the document indicates that no complete and significant exposure pathways were identified for the terrestrial food chain. Therefore, the SERA focused on the aquatic food chain.

  The procedure that was used by Arcadis (2013) for identifying the complete exposure pathways that need to be addressed in the SERA of OU-1/OU-2 is inappropriate and inconsistent with USEPA guidance. According to USEPA (1997), a contaminant must be able to travel from the source to ecological receptors and be taken up by the

receptors via one or more exposure routes for an exposure pathway to be complete. USEPA (1997) is very clear that ecological receptors, not food chains, must be the focus of the evaluation of potentially complete exposure pathways. Therefore, the CSM that was developed by Arcadis (2013) is incomplete, inappropriately excluding numerous ecological receptors utilizing aquatic and riparian habitats (i.e., floodplain and terrestrial areas within the Snow Creek basin).

Figure 2-2 of Arcadis (2013) identifies the aquatic CSM that was used to guide the SERA of OU-1/OU-2. Some of the errors in the CSM that are presented in this figure include:

1. Floodplain soils were not identified as a source of COPCs. This is incorrect because floodplain soils have elevated levels of PCBs and other COPCs and because they are inundated during high flow events and subject to downstream transport;
2. Floodplain soils were not identified as a primary exposure medium. This is incorrect because floodplain soils have elevated levels of PCBs and other COPCs and because ecological receptors can come in direct contact with floodplain soils and/or feed on the organisms that reside in these soils;
3. Periphyton was not identified as an ecological receptor group that could be exposed to COPCs at the site;
4. There is no basis in USEPA (1997; 1998) guidance for ecological risk assessment for dividing complete exposure pathways into two groups, including "high potential for complete exposure pathway" and "secondary exposure pathway expected to be minimal relative to the identified Primary complete pathways." This is a subjective distinction that results in numerous complete exposure pathways being ignored in the SERA (i.e., relative to quantitative evaluation of ecological risks);
5. Direct contact with surface water or pore water was not identified as a complete exposure pathway for any ecological receptor group. Yet, aquatic plants, aquatic invertebrates, fish, and amphibians utilizing aquatic habitats at the site would frequently come in direct contact with surface water and/or pore water at the site;
6. Direct contact with sediment was not identified as a complete exposure pathway for fish or amphibians. However, both of these receptor groups would frequently come in direct contact with sediments at the site;
7. Incidental ingestion of sediment was not identified as a complete exposure pathway for macroinvertebrates or fish. However, benthic invertebrates and benthic fish (e.g., stone rollers) will certainly be exposed to sediment-associated COPCs through ingestion of contaminated sediments; and,
8. Ingestion of prey was not identified as a complete exposure pathway for fish, amphibians, piscivorus birds, or piscivorus mammals. However, all of these receptor groups can be exposed to COPCs through the consumption of prey species. Importantly, piscivorus birds such as belted kingfishers have been observed in the OU-1/OU-2 portion of the site.

- Section 2.4; Pages 2-5 to 2-6: This section of the document indicates that the assessment endpoints that were evaluated in the SERA included:

  1. Survival, growth, and reproduction of benthic communities;
  2. Protection of local populations of aquatic-feeding birds; and,
  3. Protection of local populations of aquatic-feeding mammals.

  This list of assessment endpoints is incomplete. It does not consider many of the ecological receptor groups that are exposed to surface water, pore water, sediments, floodplain soils, or contaminated prey at the site. More specifically, aquatic plants, fish, terrestrial invertebrates utilizing riparian habitats, amphibians, and reptiles cannot be ignored in OU-1/OU-2; these receptors are essential components of the aquatic and riparian ecosystems.

  Further, the qualitative description of the assessment endpoints does not reflect the guidance provided to P/S by USEPA (i.e., all assessment endpoints should be expressed in terms of the survival, growth, and reproduction of the receptor group under consideration; See Appendix 2). Therefore, the selected assessment endpoints do not provide an appropriate basis for evaluating risks to ecological receptors associated with exposure to COPCs in OU-1/OU-2.

- Section 2.6; Page 2-7: This section in the Arcadis (2013) report indicates that the measurement endpoints that were selected to represent the most likely exposure scenario included:

  1. Compare sediment toxicity thresholds for the benthic community to measured concentrations in site sediments; and,
  2. Compare measured concentrations of COPCs in sediment to site-specific risk benchmarks for each COPC.

  This section of the document is incomplete because it does not present the risk questions (i.e., testable hypotheses) that are required to link assessment endpoints to measurement endpoints. In addition, the list of measurement endpoints is incomplete and does not reflect the guidance provided to P/S by USEPA on problem formulation (see Appendix 2, which is an excerpt from the problem formulation document prepared by USEPA for the Anniston PCB Site; MESL and Cantox Environmental Inc. 2004). While it is understood that a SERA of OU-1/OU-2 may not utilize all of the measurement endpoints identified for use in the OU-4 BERA, it is important to address all of the receptor groups for which complete exposure pathways exist for one or more environmental media. More explicitly, the following data types need to be evaluated to assess risks to each of the following ecological receptor groups:

  1. Aquatic plants: Surface-water chemistry;
  2. Aquatic invertebrates: Surface-water chemistry, pore-water chemistry, whole-sediment chemistry, and invertebrate-tissue chemistry;

3. Terrestrial invertebrates: soil chemistry and invertebrate-tissue chemistry;
4. Fish: Surface-water chemistry, whole-sediment chemistry, and fish-tissue chemistry;
5. Amphibians: Surface-water chemistry, whole-sediment chemistry, and soil chemistry;
6. Reptiles: Prey-tissue chemistry and reptile-tissue chemistry;
7. Birds: Daily doses of COPCs, as determined using data on whole-sediment chemistry, soil chemistry, invertebrate-tissue chemistry, and/or fish-tissue chemistry;
8. Mammals: Daily doses of COPCs, as determined using data on whole-sediment chemistry, soil chemistry, invertebrate-tissue chemistry, and/or fish-tissue chemistry.

- Section 4.1; Page 4-1: This section of the document indicates that exposure of benthic invertebrates to contaminated sediments was evaluated using data on the concentrations of COPCs in the 0-2 inch sediment horizon. However, this definition of the biological active zone of sediment is not supported by the definition of biologically active zones typically used for evaluating risks to benthic invertebrates associated with exposure to COPCs in sediment. For example, ASTM (2012) and USEPA (2000) define the biologically active zone as 4 to 15 cm (1.6 to 6 inches; Section 10.1.2 in ASTM 2012) to as deep as 1 meter (39 inches; Section A1.2.1 in ASTM 2012). Overall the 0-4 inch or 0-6 inch sediment horizons are most commonly used in sediment risk assessments.

- Section 4.3; Pages 4-1 to 4-3: This section describes the dietary exposure model that was used to estimate exposure of birds and mammals to COPCs, including the procedures that were used to estimate COPC concentrations in prey. While the BAFs used in the SERA appear to incorporate the USDOI comments on the OU-4 Bioaccumulation Evaluation Technical Memorandum (see Appendix 3), it appears that, the BSAFs developed by Ingersoll *et al.* (2013) were <u>not</u> used in the estimation of tissue concentrations of PCBs. As such, levels of COPCs in prey tissue may have been under-estimated, leading to under-estimates of risks to wildlife species.

- Section 5.2; Page 5-3: The Arcadis (2013) report states the site-specific risk benchmarks derived for the most sensitive endpoint for amphipods was 4.43 mg tPCBs/kg DW and for midge was 14.3 mg tPCBs/kg DW. These toxicity thresholds were developed using procedures that are not supported by any of the literature that has been published on sediment assessment. More specifically, these toxicity thresholds are not appropriate for use in the SERA because:

  1. The sediment toxicity thresholds (STTs) were estimated based on a 20% effect below the lowest reference sediment response. Neither a 10% or 20% effect below the lowest reference sediment response provide a sensitive basis for estimating toxicity thresholds and this approach is not supported by any citations of scientific literature. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs

based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013).

2. Page 5 in Appendix B states that: "Given the sometimes large variability in control responses for a toxicity endpoint, large variability can also be expected in responses of organisms exposed to OU-4 sediments. Therefore, to account for uncertainty associated with the sometimes intermediate to high variability in toxicity-test responses, the regression-predicted PCB concentration at the bottom of a reference envelope should not be used as a threshold for remediation decisions. Instead, a percentage response lower than the lowest response observed in control and reference sediments (e.g., 20 percent lower than the bottom of the reference envelope) should be used for defining a PCB concentration threshold for remediation decisions."

   In contrast to the statements made by Arcadis (2013), the inter-laboratory and intra-laboratory variability was not high relative to the estimated toxicity thresholds. Moreover, the regressions used to estimate concentration-response relationships in Ingersoll *et al.* (2013) account for this variability. Again, a 20% effect below the lowest reference sediment response is not a sensitive measure, this approach is not supported by any citations of scientific literature and double accounts for variability in the toxicity test results. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013).

3. Page 5 in Appendix B also states that the repeated testing of Sample 20 (2.5 months apart) also illustrates high variability. However, relatively low variability was observed in the repeated testing of this sediment (in contrast to the conclusion in the Arcadis (2013) report that variability was high; e.g., 6 of 12 endpoints were within 20%).

4. The STT for midge based on the most sensitive endpoint of adult emergence was not used in the SERA to evaluate risks. Inadequate justification is provided in the Arcadis (2013) report for not using the STT reported in Table B-1 of the Arcadis (2013) report. In Ingersoll *et al.* (2013), none of the peer reviewers commenting on a draft of the report questioned the use of midge adult biomass as an endpoint or questioned the assumption that average weight of emerging adults was proportional to average weight of 4th instar larvae on Day 13. The larvae on Day 13 of the exposure would be at a stage where there is reduced feeding rate before pupation, so any density-dependent effects on weight of larvae, pupae, and resultant adults would be minimal. A strong correlation was observed between adult biomass and Day 13 average weight of midge (Figure 3-15L in Ingersoll *et al.* 2013), indicating that emergence of adults was not likely biased due to the possibility of a density-dependent influence of larvae surviving to the 4th instar subsequently dying before emerging as adult.

In conclusion, the results of the control responses and repeated testing of sediment 20 do not support the conclusion on Page 6 in Appendix B to "not use the lowest response observed in control and reference sediments for defining a PCB concentration threshold for remediation decisions (e.g., instead using 20% lower than the bottom of the reference envelope for defining a risk of exposure to PCBs or to other COPCs for remediation decisions)."

Section 6.3.2; Page 6-9: The Arcadis (2013) report concludes there is too much uncertainty associated with the reference sediments selected by Arcadis for evaluation in the toxicity tests. Yet in 2010 Arcadis selected the candidate reference sediments for the current study after having evaluated the candidate reference locations and concluding that the selected reference sediments were appropriate for use in the current study. The USDOI does not understand the change in Arcadis' position vis a vis the appropriateness of the selected reference sediments. However, if it is the case that the reference sediments are somehow not appropriate, more toxicity testing of site sediments will be required in order to assess risks associated to benthic organisms with exposure to site sediments.

The reference sediments used in Ingersoll *et al.* (2013) meet the definition of a reference sediment described in USEPA (2000) and in ASTM (2012). Specifically, USEPA (2000) and ASTM (2012) define a reference sediment as: "A whole sediment near an area of concern used to assess sediment conditions exclusive of material(s) of interest. The reference sediment may be used as an indicator of localized sediment conditions exclusive of the specific pollutant input of concern. Such sediment would be collected near the site of concern and would represent the background conditions resulting from any localized pollutant inputs as well as global pollutant input. This is the manner in which reference sediment is used in dredge material evaluations."

Moreover, the (1) chemical criteria and (2) biological criteria used for selecting reference sediments by Ingersoll *et al.* (2013) met the requirements for a reference sediment as outlined in USEPA (2000) and in ASTM (2012). Specifically, the chemical criteria described by Ingersoll *et al.* (2013) for selecting reference sediments met the condition for using a reference sediment to "assess sediment conditions exclusive of material(s) of interest." Moreover, our biological criteria for selecting reference sediments meet the condition for using "a reference sediment as an indicator of localized sediment conditions exclusive of the specific pollutant input of concern." That is, the biological criteria account for unmeasured contaminants that might influence the response of test organisms in sediment. Finally, all of the reference sediments were "collected near the site of concern".

- Section 6.3.2; Page 6-9: The Arcadis (2013) report concludes there is variability in associated concentration-response curves and with the toxicity data reported in Ingersoll *et al.* (2013). This is a correct conclusion, but this variability is accounted for in the generation of the regression equations and STTs provided in Appendix B, and in the generation of alternate regression equations and alternate STTs reported in

Ingersoll *et al.* (2013). Most importantly, the reference envelope was selected for interpreting the sediment toxicity data to account for the variability in the toxicity test responses. Specifically, attempting to address this variability again by establishing STT at 20% below the lower limit of the reference envelope double accounts for this variability.

- Section 6.3.2.2; Page 6-10: Four types of STTs are summarized. A 5th source of STTs based on site-specific data should also be summarized (provided in Ingersoll *et al.* 2013).

- Section 6.4; Page 6-13: The Arcadis (2013) report concluded 18 of 37 sediments exceeded the low STT and eight of these sediments exceeded the high STT. While these results may reflect the results of data analyses, they are grossly misleading from a risk assessment perspective for the following reasons:

  1. The SSTs for PCBs used in the evaluation did not represent toxicity thresholds based on a robust analysis of the toxicity test results for sensitive endpoints evaluating effects of site sediments on amphipods or midge (i.e., relative to SSTs reported by Ingersoll *et al.* 2013).

  2. The depth of sediment evaluated (0 to 2 inches) did not represent the biologically active zone of sediments at the site.

  3. Few data were available to evaluate the risks posed to benthic invertebrates associated with exposure to metals in OU-1/OU-2 sediments (i.e., only six samples).

  4. No data were compiled on the concentrations in sediment of other COPCs that were identified in the Consent Decree or SLERA.

  Therefore, it is concluded that risks to benthic invertebrates in the OU-1/OU-2 portion of Snow Creek have been grossly underestimated in the SERA.

- Section 6.4.4; Page 6-15: The Arcadis (2013) report concluded that metal exposure of benthic invertebrates occurs at some locations. The Arcadis (2013) report has not adequately summarized SSTs for metals and has not adequately evaluated risks relative to metals SSTs. Moreover, the conclusion that there are risks to benthic invertebrates associated with exposure to site sediments is not consistent with the conclusion on Page 5 in Appendix B (that concentrations of metals did not likely contribute to the toxicity of metals in the site sediments).

- Appendix B; Page 1: Arcadis (2013) used sigmoidal curves to fit the concentration-response data that were generated from the sediment toxicity tests that were conducted at the Anniston PCB Site. In contrast, Ingersoll *et al.* (2013) utilized log-logistic or linear models to describe the concentration-response data. In the documentation that

was prepared to address reviewer comments, Ingersoll *et al.* (2013) noted that: "While the application of a linear model to a distribution of data which exhibits a log-logistic response may cause over- or under-estimation of the mean response at the low and high end of the distribution of independent variables, the choice of model should be driven by the observed data. For the data sets in question, an evaluation of the goodness-of-fit was performed and it was determined that the linear model provided a better fit to the response distributions".

"The residuals of the developed concentration-response relationships (CRRs) were evaluated using three approaches to determine if the application of the linear model resulted in residuals that were systematically biased. While the residuals of the two linear models [i.e., response of *Hyalella azteca* reproduction to increasing concentrations of PCBs and PCBs (normalized to 1%OC)] were found to be significantly different ($p = 0.05$) from a normal distribution using the Shapiro-Wilks test (PCB: $W = 0.900$, $p = 0.0179$; PCB (1%OC): $W = 0.910$, $p = 0.0311$), graphical analysis of the actual distribution of residuals provides a more robust indication of how the residuals would impact the model. Figure 1 [...] shows the graphical representation of the residuals of each of the models including: a histogram (a) and distribution relative to PCB concentrations (b) of the model residuals for the response of *Hyalella azteca* reproduction to increasing concentrations of PCBs in whole sediment; and a histogram (c) and distribution relative to PCB concentrations (d) of the model residuals for the response of *Hyalella azteca* reproduction to increasing concentrations of PCBs (normalized to 1% OC) in whole sediment. Based on the visual evaluation of the residuals in Figure 1 (Figure 1A and Figure 1C), these plots suggest that the deviation in normality is primarily driven by the low response observed in the sediment collected at TX-10-01-P rather than in a systematic bias from the use of a linear model. Further, an evaluation of Figure 1 (Figure 1B and Figure 1D) shows that while the mean model may show less toxicity at the very high-end of the concentration distribution these points deviate from the model only slightly, and over the intermediate concentrations the model fits the data quite well. Additionally, at the low-end of the distribution of concentrations, the residuals are randomly distributed about the mean response." As a result, the use of the sigmoidal models does not provide the most appropriate basis for fitting the concentration-response data that were collected at the site.

- Appendix B; Page 3: Estimates of PCB concentrations in pore water based on SPMEs, need to be discussed in the Arcadis (2013) report. Sediment toxicity thresholds based on concentrations of PCBs in pore water need to be presented and discussed (see Ingersoll *et al.* 2013 for additional detail).

- Appendix B; Page 4: It is unclear why the regression presented in Figure B-1B was used (i.e., instead of that in Figure B-1A) to estimate Aroclors from homolog concentrations in sediments. The relationship presented in Figure B-1A appears to be more appropriate for this purpose.

- Appendix B; Page 6: The Arcadis (2013) report concludes that toxicity responses were similar between USGS and USACE. This is a correct statement. However, it appears that toxicity data from the inter-laboratory tests may have been used together to generate the concentration-response regressions. Splits of the same sample should not be analyzed as separate samples. The testing of these sediment splits must not be used as separate data points for the regressions. Only data from the primary testing laboratory for a particular species should be used to generate these regressions (the most comparable data for a particular toxicity endpoint).

- Footnote C in Table B-3: Ingersoll *et al.* (2013) do not report adult survival. Is this statement in reference to emergence of adult midge?

3.0 Editorial Comments on the Streamlined Ecological Risk Assessment for OU-1/OU-2

The following editorial comments are offered on the SERA for the OU-1/OU-2 portion of Snow Creek:

- Page 5-2. ASTM should be cited as ASTM (2012), not ASTM (2005); throughout text).
- Page 5-2. Cite and discuss benchmarks for PCBs or other COPCs in whole sediment or in pore water reported by Ingersoll *et al.* (2013).
- Page 5-4. *Chironomus dilutus* is misspelled (not *dilutes*).
- Page 1 in Appendix B. The Introduction should cite Ingersoll *et al.* (2013) as a source of the data. Ingersoll *et al.* (2013) should not be cited as Ingersoll *et al.* (2012; throughout text).
- Page 1 in Appendix B. No "Materials" are described in this appendix. Re-label Section 2 as "Methods".

4.0 Comments on Remedial Investigation Report for Operable Unit 1/Operable Unit 2 of the Anniston PCB Site

USDOI conducted a cursory review of the Remedial Investigation Report for OU-1/OU-2 of the Anniston PCB Site. However, given the concerns with the adequacy of the draft SERA, USDOI concludes that it is premature to conduct a comprehensive review of the RI report.

5.0 Summary and Conclusions

The SERA for the OU-1/OU-2 portion of Snow Creek was reviewed and evaluated by USDOI. The results of this review indicate that the proposed SERA will not provide sufficient information for evaluating risks to the ecological receptors that utilize or could utilize aquatic and riparian habitats in the OU-1/OU-2 portion of Snow Creek. Some of the key issues and concerns associated with the SERA include:

- The COPCs that were selected for evaluation in the SERA are not consistent with those identified in the Consent Decree, in the SERA that was conducted at the site, or in the comments on the COPC Evaluation White Paper (Arcadis 2012);
- The CSM that was developed to support the SERA is incomplete. Numerous sources of COPCs, exposure media, exposure routes, ecological receptor groups, and complete exposure pathways have not been included in the CSM;
- The assessment endpoints and measurement endpoints that were selected to guide the SERA are incomplete and inappropriate. In addition, no risk questions or testable hypotheses were articulated;
- The data set that was used to evaluate risks to ecological receptors is incomplete and does not provide a strong basis for evaluating exposure to COPCs in any media type;
- The toxicity reference values that were selected for PCBs in sediments are inappropriate and reflect incorrect interpretations of the site-specific toxicity test data that were collected at the site;
- The combined effects of dioxin-like PCBs, PCDDs, and PCDFs (i.e., T_4CDD-TEQs) were not evaluated in birds or mammals;
- The toxicity thresholds that were selected for PCBs for birds and mammals are incomplete and require further development; and,
- The evaluations and interpretations of risks to ecological receptors are incomplete and inappropriate.

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United States Department of the Interior

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IN REPLY REFER TO

JUL 0 8 2013

Pamela J. Langston Scully
Remedial Project Manager
Superfund Remedial Branch
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Pam:

Thank you for the opportunity to review the June 2013 revision of the ***Streamlined Ecological Risk Assessment for the OU-1/OU-2 portion of Snow Creek, Anniston PCB Site, Anniston, Alabama***, that was prepared by Arcadis (2013) on behalf of Pharmacia LLC and Solutia Inc. (P/S). Based on the results of this review, the U.S. Department of the Interior (USDOI) remains concerned that the streamlined ecological risk assessment (SERA) does not provide a defensible basis for evaluating risks to the ecological receptors that utilize or could utilize aquatic and riparian habitats in the OU-1/OU-2 portion of Snow Creek. Therefore, the results of the SERA should not be incorporated into the remedial investigation (RI) for OU-1/OU-2 of the Anniston PCB Site and should not be used to guide decisions related to the feasibility study (FS). The comments prepared by USDOI on the technical approaches that were used in the SERA for OU-1/OU-2 are summarized in this document.

Section A: USDOI comments on ARCADIS' June 5 2013 responses to USEPA April 23, 2013 comments on the February 2013 draft of the ARCADIS SERA

1. ARCADIS Response #9 and #21

In regard to Section 4.1, dealing with the depth of sediment considered the biologically active zone.

As USDOI previously stated:

This section of the document indicates that exposure of benthic invertebrates to contaminated sediments was evaluated using data on the concentrations of chemicals of potential concern (COPCs) in the 0-2 inch sediment horizon. However, this definition of the biological active zone of sediment is not supported by the definition of biologically active zones typically used for evaluating risks to benthic invertebrates associated with exposure to COPCs in sediment. For example, ASTM (2012) and USEPA (2000) define the biologically active zone as 4 to 15 centimeters (cm) (1.6 to 6 inches; Section 10.1.2 in ASTM 2012) to as deep as 1 meter (39 inches; Section A1.2.1 in ASTM 2012). Overall the 0-4 inch or 0-6 inch sediment horizons are most commonly used in sediment risk assessments.

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USDOI comment: In the June 2013 SERA, ARCADIS justifies the decision to use the 0-2 inch sediment horizon by stating "This depth interval encompasses the biologically active zone where the majority of the contact between ecological receptors, their prey, and sediment is likely to occur" (no reference provided). USDOI does not agree that the 0-2 inch sediment horizon represents the biologically active zone of sediments at the site.

2. ARCADIS Response #28

In regard to Table 5-1: Uncertainty text was added to the OU-1/OU-2 SERA that discusses the potential effects of co-contamination. Threshold effect concentrations (TECs) and probable effect concentrations (PECs) were added to Table 5-1 and comparisons to site data are provided in Section 6.1.

USDOI comment: The revised Table 5-1 does not include the site-specific, risk-based concentrations from Ingersoll *et al.* (2013), which should be used as part of the evaluation. Table 5-1 still provides only the site-specific EC20s generated by ARCADIS. There are numerous issues associated with the EC20s developed by ARCADIS.

As USDOI previously stated:

The ARCADIS (2013) report states the site-specific risk benchmarks derived for the most sensitive endpoint for amphipods was 4.43 mg tPCBs/kg DW and for midge was 14.3 mg tPCBs/kg DW. These toxicity thresholds were developed using procedures that are not supported by any of the literature that has been published on sediment assessment. More specifically, these toxicity thresholds are not appropriate for use in the SERA because:

- The ARCADIS (2013) sediment toxicity thresholds (STTs) were estimated based on a 20% effect below the lowest reference sediment response. Neither a 10% or 20% effect below the lowest reference sediment response provide a sensitive basis for estimating toxicity thresholds and this approach is not supported by any citations of scientific literature. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013).

- Page 5 in Appendix B in ARCADIS (2013) states that: "Given the sometimes large variability in control responses for a toxicity endpoint, large variability can also be expected in responses of organisms exposed to OU-4 sediments. Therefore, to account for uncertainty associated with the sometimes intermediate to high variability in toxicity-test responses, the regression-predicted PCB concentration at the bottom of a reference envelope should not be used as a threshold for remediation decisions. Instead, a percentage response lower than the lowest response observed in control and reference sediments (e.g., 20 percent lower than the bottom of the reference envelope)

should be used for defining a PCB concentration threshold for remediation decisions."

In contrast to the statements made by ARCADIS (2013), the inter-laboratory and intra-laboratory variability was not high relative to the estimated toxicity thresholds. Moreover, the regressions used to estimate concentration-response relationships in Ingersoll *et al.* (2013) account for this variability. Again, a 20% effect below the lowest reference sediment response is not a sensitive measure, this approach is not supported by any citations of scientific literature and double accounts for variability in the toxicity test results. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013).

- Page 5 in Appendix B in ARCADIS (2013) also states that the repeated testing of Sample 20 (2.5 months apart) also illustrates high variability. However, relatively low variability was observed in the repeated testing of this sediment (in contrast to the conclusion in the ARCADIS (2013) report that variability was high; e.g., 6 of 12 endpoints were within 20%).

- The STT for midge based on the most sensitive endpoint of adult emergence was not used in the SERA to evaluate risks. Inadequate justification is provided in the ARCADIS (2013) report for not using the STT reported in Table B-1 of the ARCADIS (2013) report. In Ingersoll *et al.* (2013), none of the peer reviewers commenting on a draft of the report questioned the use of midge adult biomass as an endpoint or questioned the assumption that average weight of emerging adults was proportional to average weight of 4th instar larvae on Day 13. The larvae on Day 13 of the exposure would be at a stage where there is reduced feeding rate before pupation, so any density-dependent effects on weight of larvae, pupae, and resultant adults would be minimal. A strong correlation was observed between adult biomass and Day 13 average weight of midge (Figure 3-15L in Ingersoll *et al.* 2013), indicating that emergence of adults was not likely biased due to the possibility of a density-dependent influence of larvae surviving to the 4th instar subsequently dying before emerging as adult.

In conclusion, the results of the control responses and repeated testing of sediment 20 do not support the conclusion on Page 6 in Appendix B of ARCADIS (2013) to "not use the lowest response observed in control and reference sediments for defining a PCB concentration threshold for remediation decisions (e.g., instead using 20% lower than the bottom of the reference envelope for defining a risk of exposure to PCBs or to other COPCs for remediation decisions)."

3. ARCADIS Response #29

In regard to Section 5-2: Table B-1 was expanded as requested. It should be noted that the 10% effect levels (along with the 20% and 50% effect levels) already are reported in Table B-1. As also

requested, the results for the 0% and 10% effect levels below the reference envelope are discussed in the text of the OU-1/OU-2 SERA along with the 20% effects levels.

USDOI comment: Adding the results for the 0% and 10% effect levels below the reference envelope does not constitute a sufficient revision; the Ingersoll *et al.* (2013) effect concentrations must also be used as part of the evaluation.

4. ARCADIS Response #29

In regard to Section 5-2: The test acceptability criteria specified for the standard USEPA protocols for the two test species (USEPA/600R-99/064) include:

- *H. azteca*: Minimum mean control survival of 80% and measurable growth of test organisms in the control sediment.
- *C. tentans*: Minimum mean control survival of 70% and minimum mean weight per surviving control organism of 0.48 mg AFDW.

These acceptability criteria provide a reasonable basis to assess potential toxicity to test organisms because these criteria are applied to negative laboratory control tests (i.e., tests conducted in sediment essentially free of contaminants) to provide a measure of test acceptability, evidence of test organism health, and a basis for interpreting data from the test sediments. When a negative laboratory control meets the test acceptability criteria, it suggests test organisms were not adversely affected by exposure conditions. Site samples that meet these acceptability criteria should therefore indicate that test organisms were not adversely affected by exposure conditions in the Site sediment. Thus, a 20% effect level is deemed adequately protective and representative of the precision of the testing protocols.

USDOI comment: Test acceptability for control sediments are not described as the basis for establishing toxicity in either the USEPA or ASTM standard methods. Toxicity of site sediments *must* be compared to the reference condition, not to conditions used to evaluate the acceptability of a control sediment (as was the design for interpretation of the site-specific toxicity data). Establishing site-specific toxicity relative response in a control sediment collected from Minnesota is not technically valid.

ARCADIS response associated with Section 5-2: The testing conducted for the Anniston Site used similar protocols but longer durations.

USDOI comment: We are **unsure** how this response fits in the context of the comments for the rest of this section.

5. ARCADIS Response #33

In regard to Section 6.3.3.1, Pages 6-15 to 6-17: Dealing with uncertainties associated with PCB Sediment Benchmarks

a. ARCADIS states: "Uncertainty in the sediment-toxicity benchmarks (EC0*, EC10*, EC20*, and EC50* values) has five components: (1) whether the reference sediments are "true" reference sediments for the Site; (2) whether the lowest measured reference-sediment response for a given toxicity endpoint adequately represents the lowest response that would be caused by a reference sediment; (3) variability in the calculated EC0*, EC10*, EC20*, and EC50* values; (4) inherent variability in results of toxicity tests; and (5) potential variability between batches of toxicity tests conducted at different times and in different laboratories a considerable length of time after the sediments were collected from OU- 4. These five potential sources of uncertainty are discussed below. Regarding the first uncertainty, the six reference sediments collected from Choccolocco Creek approximately 3 kilometers upstream of its confluence with Snow Creek came from an agricultural area that does not receive urban inputs. Therefore, the reference sediments do not have physical-chemical characteristics of an urban influenced stream and might underestimate the toxicity caused by chemicals that originated from non-Site sources, thus, overestimating the toxicity caused by inputs originating from the Site."

USDOI comment: As USDOI previously stated:

"In 2010, ARCADIS selected the candidate reference sediments for the current study after having evaluated the candidate reference locations and concluding that the selected reference sediments were appropriate for use in the current study. The USDOI does not understand the change in ARCADIS' position regarding the appropriateness of the selected reference sediments. However, if it is the case that the reference sediments are somehow not appropriate, more toxicity testing of site sediments will be required in order to assess risks associated to benthic organisms with exposure to site sediments.

The reference sediments used in Ingersoll *et al.* (2013) meet the definition of a reference sediment described in USEPA (2000) and in ASTM (2012). Specifically, USEPA (2000) and ASTM (2012) define a reference sediment as: 'A whole sediment near an area of concern used to assess sediment conditions exclusive of material(s) of interest. The reference sediment may be used as an indicator of localized sediment conditions exclusive of the specific pollutant input of concern. Such sediment would be collected near the site of concern and would represent the background conditions resulting from any localized pollutant inputs as well as global pollutant input. This is the manner in which reference sediment is used in dredge material evaluations.'

Moreover, the (1) chemical criteria and (2) biological criteria used for selecting reference sediments by Ingersoll *et al.* (2013) met the requirements for a reference sediment as outlined in USEPA (2000) and in ASTM (2012). Specifically, the chemical criteria described by Ingersoll *et al.* (2013) for selecting reference sediments met the condition for using a reference sediment to "assess sediment conditions exclusive of material(s) of interest." Moreover, our biological criteria for selecting reference sediments meet the condition for using "a reference sediment as an indicator of localized sediment conditions exclusive of the specific pollutant input of concern," in that the biological criteria account for unmeasured contaminants that might influence the response of test organisms in sediment. Finally, all of the reference sediments were 'collected near the site of concern'.

b. ARCADIS states: "Regarding the second uncertainty, only six reference sediments might not adequately represent the entire range of potential reference-sediment responses, even if the reference sediments contained appropriate background chemicals and toxicity from non-Site sources. Therefore, the lowest reference-sediment response for a given toxicity endpoint might not be representative of the "true" lower limit of the reference values, contributing to a potential underestimate or overestimate of the toxicity caused by inputs originating from the Site.

USDOI comment: If the true lower limit of the reference values was not established, then additional sediment testing is needed. See additional responses described above under Section 1a.

c. ARCADIS states: "Regarding the third uncertainty, there is variability in the responses of the OU-4 sediments around the central-tendency concentration-response curves for each endpoint (see Figures B-3 and B-4 in Appendix B). Furthermore, there is variability in the toxicity responses for repeated testing of a given sediment (see Appendix B and below). Therefore, there is statistical uncertainty in the EC0*, EC10*, EC20*, and EC50* values listed in Table B-1 (Appendix B)."

USDOI comment: As USDOI previously stated:

"This variability is accounted for in the generation of the regression equations and STTs provided in Appendix B, and in the generation of alternate regression equations and alternate STTs reported in Ingersoll *et al.* (2013). Most importantly, the reference envelope was selected for interpreting the sediment toxicity data to account for the variability in the toxicity test responses. Specifically, attempting to address this variability again by establishing STT at 20% below the lower limit of the reference envelope double accounts for this variability."

"Neither a 10% or 20% effect below the lowest reference sediment response provide a sensitive basis for estimating toxicity thresholds and this approach is not supported by any citations of scientific literature. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013)."

d. ARCADIS states: "Regarding the fourth uncertainty, results of sediment toxicity tests can be highly variable for some endpoints, even when conducted in the highly-skilled laboratories that conducted the tests with OU-4 sediments (Appendix B). For example, the OU-4 tests were conducted in three batches, each with its own control sediment (but the same sediment was used as a control in all three batches). The variation among the three control responses for the 23 endpoints ranged from 1.3% to 137% of the mean of the three results (Appendix B). In general, survival and hatch-percentage endpoints varied by relatively small percentages (1.3 to 4.4%), growth endpoints varied by intermediate percentages (18 to 80%), and reproduction endpoints varied by intermediate to large percentages (25 to 137%). Given this sometimes large variability in control responses for a toxicity endpoint, large variability can also be expected in responses of organisms

exposed to OU-4 sediments. For example, for the one OU-4 sediment that was repeat-tested two months apart in the same laboratory, the difference in control-normalized response for the 12 endpoints ranged from 0.2% to 74% of the mean of the two results. Six (50%) of those endpoints had differences that were less than 20% of the mean control-normalized response, and five (42%) had differences between 20 and 50% of the mean control-normalized response. The median difference was 22.4%. Therefore, when comparing any one response percentage to a specified threshold for significant effects (e.g., an EC0*, EC10*, EC20*, or EC50*), it should be recognized that the "true" toxicity of that sediment might be accurately estimated, considerably underestimated, or considerably overestimated by the result from a single toxicity test. In contrast, the regression-based predictions of PCB concentrations that cause a specified percentage response are central-tendency estimates that tend to "average-out" that variability, making the regression-based predictions of effect percentages less uncertain than the results from any single sediment toxicity test."

USDOI comment: As USDOI previously stated:

"In contrast to the statements made by ARCADIS (2013), the inter-laboratory and intra-laboratory variability was not high relative to the estimated toxicity thresholds. Moreover, the regressions used to estimate concentration-response relationships in Ingersoll *et al.* (2013) account for this variability. Again, a 20% effect below the lowest reference sediment response is not a sensitive measure, this approach is not supported by any citations of scientific literature and double accounts for variability in the toxicity test results. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013)."

"Ingersoll *et al.* (2013) demonstrated that relatively low variability was observed in the repeated testing of this sediment (in contrast to the conclusion in the ARCADIS (2013) report that variability was high; e.g., 6 of 12 endpoints were within 20%)." More specifically, "Sediment 20 was tested in cycle 1a and retested in cycle 1b with *C. dilutus* by USGS-Columbia to determine repeatability of effects observed across storage time between the start of cycle 1a and the start of cycle 1b. Percent survival was high in both cycles of testing (cycle 1a = 85.4 percent; cycle 1b = 97.9 percent) and mean total biomass at day 13 was similar in both cycles (cycle 1a = 9.61 mg; cycle 1b = 10.12 mg). Percent emergence and adult biomass also were similar between cycles of testing (for example, percent emergence in cycle 1a = 54.2 percent, in cycle 1b = 62.5 percent). Whereas the mean number of egg cases produced in cycle 1b (3.8) was greater than that for cycle 1a (1.6), the mean number of eggs produced per egg case was similar (cycle 1a = 982.2; cycle 1b = 992.2), as was hatching percentage (cycle 1a = 98.4 percent; cycle 1b = 93.6 percent). Because of the overall greater number of egg cases produced in cycle 1b, the mean total number of young produced also was higher in cycle 1b (3,461.6, 84.7 percent of the control response) relative to cycle 1a (1,610.8, 52.3 percent of the control response). Hence, Ingersoll *et al.* (2013) concluded that repeated testing of Sample 20 illustrated low variability, particularly for critical endpoints (Day 13 survival, weight and biomass, and adult biomass and emergence). For example, emergence varied by only 14% and 13-d biomass varied by only 5%."

e. ARCADIS states: "Regarding the fifth uncertainty, the OU-4 sediments used in the toxicity tests were collected in August 2010 but were not tested until November 2010 (the first cycle of testing) or January 2011 (the second cycle of testing). Those intervening periods exceeded the maximum eight-week hold time recommended by USEPA (2000) before sediment toxicity tests should be started. During storage, the chemical characteristics of the sediments might have changed, thus altering the concentrations and/or bioavailability of the PCBs and other potential contributors to toxicity. However, those delays were decided to be necessary: (1) to provide time for chemical analyses of the sediments, so informed decisions could be made about which sediments to test in which batch, and (2) because the two contracted laboratories did not have enough capacity to conduct all the toxicity tests in one batch (i.e., a minimum two-month interval was needed between batches to allow the *C. dilutus* tests in the first batch to be completed before starting the second batch of tests). The extended hold times were deemed acceptable because the primary goal of the testing was to develop generic concentration-response relationships of toxicity versus PCB concentration (for extrapolation to all OU-4 sediments (not only those sediments that were tested) and was not to specifically characterize the "true" toxicity of any given OU-4 sediment. Therefore, although changes in the chemistry of sediments that are stored beyond the eight-week hold time can contribute to interpretation uncertainties, the uncertainty is less when the results of the toxicity tests are used to develop concentration-response relationships (as in this application) than when they are used to decide whether a specific sediment is toxic when tested after its hold time has been exceeded (which was not the purpose of these toxicity tests)."

USDOI comment: This is a new issue identified by ARCADIS.

Neither USEPA (2000) nor ASTM (2012) require a maximum holding time of 2 months for sediment. Specifically these standards state: "Sediments that contain comparatively stable compounds (e.g., high molecular weight compounds such as PCBs) or which exhibit a moderate-to-high level of toxicity, typically do not vary appreciably in toxicity in relation to storage duration. For these sediments, long-term storage (e.g., >8 weeks) can be undertaken." Additionally, these standards state: "Researchers may wish to conduct additional characterizations of sediment to evaluate possible effects of storage. Concentrations of chemicals of concern could be measured periodically in pore water during the storage period and at the start of the sediment test."

Importantly, the approach used by Ingersoll *et al.* (2013) was in compliance with USEPA and ASTM guidance regarding storage time and regarding characterization of sediment chemistry within the time period of conducting the toxicity tests with each batch of sediments (e.g., SPMEs, pore-water chemistry). Additionally, ARCADIS worked with USGS and USACE in the selected design of the study (in regard to storage and characterization of sediments).

6. ARCADIS Response #36

In regard to Section 6.4: The conclusions of the sediment toxicity and bioaccumulation testing report prepared by the United States Geological Survey (USGS) are not presented in the OU-

1/OU-2 SERA. These conclusions were separately developed by the USGS for their own purposes.

USDOI comment: The sediment toxicity thresholds developed by Ingersoll *et al.* 2013 need to be included in the SERA for OU-1/OU-2 based on the numerous limitations identified with the sediment toxicity threshold developed by ARCADIS.

As USDOI previously stated:

The ARCADIS (2013) report states the site-specific risk benchmarks derived for the most sensitive endpoint for amphipods was 4.43 mg tPCBs/kg DW and for midge was 14.3 mg tPCBs/kg DW. These toxicity thresholds were developed using procedures that are not supported by any of the literature that has been published on sediment assessment. More specifically, these toxicity thresholds are not appropriate for use in the SERA because the STTs were estimated based on a 20% effect below the lowest reference sediment response. Neither a 10% or 20% effect below the lowest reference sediment response provide a sensitive basis for estimating toxicity thresholds and this approach is not supported by any citations of scientific literature. Ingersoll *et al.* (2013) report an alternate approach for calculating STTs based on the lowest reference sediment response (an approach that is supported by multiple citations provided in Ingersoll *et al.* 2013)."

7. ARCADIS Response #63

While capping is a remedial technology that may be considered in the OU-1/OU-2 FS report, the accepted approaches for assessing PCB flux and long-term cap stability would be primary factors considered under an evaluation of long term effectiveness. The FS will address risks identified as part of the risk assessment process and may not specifically identify sediment toxicity, including toxicity that could be inferred from SPME data.

USDOI comment: This is not an acceptable response to USEPA's comment that SPME data should be discussed and used to generate site-specific toxicity thresholds.

As USDOI previously stated:

Estimates of PCB concentrations in pore water based on SPMEs, need to be discussed in the ARCADIS (2013) report. Sediment toxicity thresholds based on concentrations of PCBs in pore water need to be presented and discussed (see Ingersoll *et al.* 2013 for additional detail).

8. ARCADIS Response #64

In regard to Appendix B: A comparison of the most sensitive endpoint in the Anniston PCB sediment toxicity tests [*Hyalella* 42-d young/female (normalized to adult survival)], with and without averaging the results for the 5 non-lab control duplicate sediments was performed. The results are similar with and without averaging the duplicate sediments. Based on these results the

same calculations for all the other endpoints were not conducted. Additional text and tables providing the results of this analysis were included in Appendix B.

USDOI comment: USDOI does not agree with the recommendation from USEPA to average inter-laboratory results. Inter-laboratory data should only be used to generate regressions. It is not appropriate to average responses across laboratories.

Section B: Summary of outstanding USDOI comments on the ARCADIS SERA (June 2013)

1. Section 1.1, Page 1-2: The SERA does not evaluate the floodplain or terrestrial areas of the OU-1/OU-2 portion of Snow Creek

As USDOI previously stated:

This section of the document indicates that the SERA does not evaluate floodplain or terrestrial areas within OU-1/OU-2 and focuses on receptors that may be exposed in the aquatic portion of Snow Creek. While P/S may have an interest in limiting the scope of the study area and receptors that are addressed in the SERA, the ERA must, at minimum, evaluate those areas where COPCs from the Facility have come to be located (i.e., in accordance with the Partial Consent Decree) and those ecological receptors that occur or may occur in aquatic or floodplain habitats within OU-1/OU-2. Therefore, the scope of the SERA, as defined by ARCADIS (2013), is too narrow and the SERA may not capture enough information to adequately characterize risk posed to the environment by the COPCs.

USDOI comment: The rationale provided in Section 1.1 for not including an evaluation of floodplain or terrestrial habitats in the SERA is unacceptable. While habitat may not be optimal, riparian habitats in Upper Snow Creek are utilized by a diversity of ecological receptors, including aquatic plants, aquatic invertebrates, crustaceans, fish, amphibians, reptiles, birds, and mammals (as stated in Section 2.1.3). Therefore, USDOI does not agree that issues related to habitat quality provide the necessary and sufficient rationale for excluding terrestrial habitats from the SERA.

2. Section 2.1, Pages 2-1 to 2-4: The rationale for conducting a SERA, rather than a BERA, is contradicted by the description of the ecological setting of OU-1/OU-2

As USDOI previously stated:

This section of the document describes the ecological setting in the study area. While the results of habitat surveys conducted in the study area indicated that aquatic and terrestrial habitats were not optimum, this section of the document acknowledges that aquatic and riparian habitats in Upper Snow Creek are utilized by a diversity of ecological receptors, including aquatic plants, aquatic invertebrates, crustaceans, fish, amphibians, reptiles, birds, and mammals. Therefore, USDOI does not agree that issues related to habitat quality provide the necessary and sufficient rationale for conducting the SERA (i.e., instead of conducting a more robust BERA). Habitats within the Upper

Snow Creek watershed provide important habitat values and cannot be written off by P/S or USEPA.

USDOI comment: While this section was expanded in the June 2013 SERA to describe the highly disturbed nature of the study area, the terrestrial and aquatic survey summarized in Section 2.1.3 describes the use of terrestrial habitats by ecological receptors. Therefore, USDOI recommends that a more robust assessment (i.e., a BERA) is conducted for OU-1/OU-2.

3. Section 2.2, Page 2-5: The list of COPCs is incomplete.

As USDOI previously stated:

This section of the document indicates that PCBs, barium, chromium, cobalt, lead, manganese, mercury, nickel, vanadium, and PCDDP/SCDFs were carried through the SERA (at the request of USEPA). While USDOI agrees that these COPCs need to be addressed in the SERA, this list of COPCs is incomplete (see USEPA comments on the Anniston PCB Site - COPC Evaluation White Paper to which detailed comments from USDOI were attached; ARCADIS 2012.) For floodplain soils, arsenic, PAHs, aldrin, dieldrin, and heptachlor epoxide frequently exceeded screening-level tissue residue values (TRVs) and, hence, should be carried forward into the SERA. In addition, the concentrations of arsenic, copper, zinc, PAHs, and numerous organochlorine pesticides exceeded screening-level TRVs in sediments and, hence, should be carried forward into the SERA. Failure to consider all of the COPCs that occur in sediments or floodplain soils at levels sufficient to pose potential risks to ecological receptors renders the resultant SERA unreliable.

USDOI comment: This section was expanded in the June 2013 SERA to state that a wider list of COPCs (including VOCs, SVOCs, PAHs, PCDD/PCDFs, and TAL inorganics) was assessed in the RI for OU-1/OU-2, and that the results of the evaluation supported PCBs as the primary risk driver for OU-1/OU-2. While PCBs were identified as a primary risk driver, additional COPCs were carried through into the SERA. It is unclear why the additional COPCs identified by USDOI were not carried into the SERA.

4. Section 2.3, Pages 2-5 to 2-7 and Figure 2-2: The conceptual site model is inappropriate and inconsistent with USEPA guidance.

As USDOI previously stated:

The procedure that was used by ARCADIS (2013) for identifying the complete exposure pathways that need to be addressed in the SERA of OU-1/OU-2 is inappropriate and inconsistent with USEPA guidance. According to USEPA (1997), a contaminant must be able to travel from the source to ecological receptors and be taken up by the receptors via one or more exposure routes for an exposure pathway to be complete. USEPA (1997) is very clear that ecological receptors, not food chains, must be the focus of the evaluation of potentially complete exposure pathways. Therefore, the CSM that was developed by ARCADIS (2013) is incomplete, inappropriately excluding numerous ecological receptors utilizing aquatic and riparian habitats (i.e., floodplain and terrestrial areas within the Snow Creek basin).

USDOI comment: Figure 2-2 of ARCADIS (2013) outlines the CSM that was used to guide the SERA of OU-1/OU-2. Although the CSM has been revised in the June 2013 version of the SERA, errors that remain in this figure include:

- Floodplain soils were not identified as a source of COPCs. This is incorrect because floodplain soils in OU-1/OU-2 have been shown to have elevated levels of PCBs and other COPCs resulting from inundation during high flow events and downstream transport;

- Floodplain soils were not identified as a primary exposure medium. This is incorrect because floodplain soils have elevated levels of PCBs and other COPCs. Ecological receptors can be exposed to PCBs and other COPCs through direct contact with floodplain soils and/or feed on organisms that utilize these habitats;

- Periphyton was not identified as an ecological receptor group that could be exposed to COPCs at the site; and,

- There is no basis in USEPA (1997; 1998) guidance for ecological risk assessment for dividing complete exposure pathways into groups, including "high potential for complete exposure pathway", "secondary exposure pathway expected to be minimal relative to the identified Primary complete pathways" and "exposure pathway considered de minimus:". This is a subjective distinction that results in numerous complete exposure pathways being ignored in the SERA (i.e., relative to quantitative evaluation of ecological risks).

5. Section 2.4, Pages 2-7 to 2-8: The list of assessment endpoints is incomplete.

As USDOI previously stated:

This list of assessment endpoints is incomplete. It does not consider many of the ecological receptor groups that are exposed to surface water, pore water, sediments, floodplain soils, or contaminated prey at the site. More specifically, aquatic plants, fish, terrestrial invertebrates utilizing riparian habitats, amphibians, and reptiles cannot be ignored in OU-1/OU-2; these receptors are essential components of the aquatic and riparian ecosystems.

USDOI comment: ARCADIS states in the June 2013 SERA that the identification of assessment endpoints were based on the "complete and significant exposure pathways" identified in the CSM. Since the procedure used to develop the CSM was inappropriate (see comments pertaining to the CSM, above), a number of receptor groups have been excluded from the assessment. The CSM should consider all complete pathways significant, and therefore assessment endpoints should be identified for all receptor groups for which complete pathways have been established.

6. Section 2.6, Pages 2-10 to 2-11: The list of measurement endpoints is incomplete.

As USDOI previously stated:

The list of measurement endpoints is incomplete and does not reflect the guidance provided to P/S by USEPA on problem formulation (see Appendix 2, which is an excerpt from the problem formulation document prepared by USEPA for the Anniston PCB Site; MESL and Cantox Environmental Inc. 2004). While it is understood that a SERA of OU-1/OU-2 may not utilize all of the measurement endpoints identified for use in the OU-4 BERA, it is important to address all of the receptor groups for which complete exposure pathways exist for one or more environmental media. More explicitly, the following data types need to be evaluated to assess risks to each of the following ecological receptor groups:

- Aquatic plants: Surface-water chemistry;
- Aquatic invertebrates: Surface-water chemistry, pore-water chemistry, whole-sediment chemistry, and invertebrate-tissue chemistry;
- Terrestrial invertebrates: soil chemistry and invertebrate-tissue chemistry;
- Fish: Surface-water chemistry, whole-sediment chemistry, and fish-tissue chemistry;
- Amphibians: Surface-water chemistry, whole-sediment chemistry, and soil chemistry;
- Reptiles: Prey-tissue chemistry and reptile-tissue chemistry;
- Birds: Daily doses of COPCs, as determined using data on whole-sediment chemistry, soil chemistry, invertebrate-tissue chemistry, and/or fish-tissue chemistry; and,
- Mammals: Daily doses of COPCs, as determined using data on whole-sediment chemistry, soil chemistry, invertebrate-tissue chemistry, and/or fish-tissue chemistry.

7. Section 6.4, Page 6-20: Risk Findings

ARCADIS states: For PCBs, the comparison of the low SSRBC to sediment concentrations shows that 47% of the sample locations exceed this benchmark (Table 6-4), while 19% exceeded the high benchmark.

As USDOI previously stated:

"While these results may reflect the results of data analyses, they are grossly misleading from a risk assessment perspective for the following reasons:

a. The SSTs for PCBs used in the evaluation did not represent toxicity threshold based on a robust analysis of the toxicity test results for sensitive endpoints evaluating effects of site sediments on amphipods or midge (i.e., relative to SSTs reported by Ingersoll *et al.* 2013).
b. The depth of sediment evaluated (0 to 2 inches) did not represent the biologically active zone of sediments at the site.
c. Few data were available to evaluate the risks posed to benthic invertebrates associated with exposure to metals in OU-1/OU-2 sediments (i.e., only six samples).

d. No data were compiled on the concentrations in sediment of other COPCs that were identified in the Consent Decree or SLERA."

8. Appendix B, Section 3, Figure B-1a: Regression used for estimating Aroclors from homologs

ARCADIS states: When regressed across all the OU-4 sediments collected for toxicity testing, the tPCBH concentration was approximately 2 times the tPCBA concentration (Figure B-1a). That relationship was evident down to a concentration of approximately 0.6 mg tPCBA/kg dw sediment; however, at concentrations less than 0.6 mg tPCBA/kg dw sediment, the tPCBH:tPCBA ratio was approximately 1:1 (Figure B-1b).
As USDOI previously stated:
It is unclear why the regression presented in Figure B-1b was used (i.e., instead of that in Figure B-1a) to estimate Aroclors from homolog concentrations in sediments. The relationship presented in Figure B-1A appears to be more appropriate for this purpose.

9. The following tables have been added but are not described in the revised SERA:

a. Table B-4. Independent and averaged *Hyalella azteca* 42-d young/female (normalized to 42-d survival), for the six sediments that were tested in both the USGS and the USACE labs during Cycle 1a.
b. Table B-5. Nonlinear regression fits for *Hyalella azteca* 42-d young/female (normalized to 42-d survival) fitted to all USGS and USACE sediment data from Cycles 1a and 1b, with and without the results for the duplicate sediments averaged.
c. Table B-6 Inhibition concentrations (relative to the bottom of the reference envelope) in Anniston PCB sediment toxicity tests, for *Hyalella azteca* 42-d young/female (normalized to 42-d survival) with and without the results for the duplicate sediments averaged.

10. As USDOI previously stated:

The combined effects of dioxin-like PCBs, PCDDs, and PCDFs (i.e., T4CDD-TEQs) were not evaluated in birds or mammals.

USDOI comment: The structures of certain PCB congeners (i.e., coplanar PCBs) are similar to those of polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). Because coplanar PCBs have a similar mode of toxicity as dioxins and furans, carcinogenic, mutagenic, and teratogenic effects could be associated with long-term exposure, bioaccumulation, and/or biomagnification of PCB congeners and mixtures.

An additive model of toxicity based on the determination of the relative toxicities of dioxin-like substances in relation to that of 2,3,7,8-TCDD is recommended for use in ecological risk assessment with fish and wildlife species (Tillitt 1999). Specifically, toxic equivalency factors (TEFs) are assigned to each chemical based on the results of both in vivo and in vitro studies. The most recent TEFs that have been established for coplanar PCBs are presented in Van den Berg *et al.* (1998, 2006).

As USDOI previously stated:

The toxicity thresholds that were selected for PCBs for birds and mammals are incomplete and require further development.

USDOI comment: The TRVs selected for use in the SERA for PCBs, 2,3,7,8-TCDD TEQs, mercury, and manganese to evaluate exposure to these COPCs by avian receptors are inconsistent with the TRVs recommended for use by USDOI. In addition, the TRVs selected for use in the SERA for PCBs, 2,3,7,8-TCDD TEQs, mercury, and manganese to evaluate exposure to these COPCs by mammalian receptors are inconsistent with the TRVs recommended for use by USDOI. Further, studies on the effects of PCBs on mink were unjustifiably excluded from the derivation of TRVs for use in the SERA.

Thank you again for providing us the opportunity to review the revised SERA. I look forward to our continuing discussions regarding the points addressed in this letter. Please let me know if you have any questions.

Sincerely,

Karen W. Marlowe
Anniston PCB NRDAR Case Manager

cc: Amy Horner, DOI-Solicitor, Washington, D.C.
Diane Beeman, USFWS NRDAR Coordinator, Atlanta, GA
Will Brantley, ADCNR, Montgomery, AL
Marlon Cook, GSA, Tuscaloosa, AL
Will Gunter, General Counsel, ADCNR, Montgomery, AL
Bennett Bearden, Assistant Attorney General, GSA, Tuscaloosa, AL
Bill Weinischke, DOJ, Washington, D.C.
Davis Forsythe, DOJ, Denver, CO
Rudy Tanasijevich, EPA Solicitor, Atlanta, GA

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United States Department of the Interior

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IN REPLY REFER TO

OCT 0 8 2015

Pamela J. Langston Scully
Remedial Project Manager
Superfund Remedial Branch
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Scully:

Thank you for the opportunity to review the ***Draft Technical Memorandum Summarizing Results of Comparative Analysis of Alternatives for Operable Unit 1/Operable Unit 2 Anniston PCB Site (Docket No. 1:02-cv-0749-KOB); Anniston, Alabama*** (Technical Memorandum), that was prepared by Ramboll Environ on behalf of Pharmacia LLC and Solutia Inc. (Ramboll 2015). You requested that we provide comments on the Technical Memorandum no later than October 9, 2015. Unfortunately, I was away from my office when the Technical Memorandum was received and was not aware of the document until September 22, 2015. In order to provide the Natural Resource Trustees (NRTs) sufficient time to receive, review, and provide comments on the Technical Memorandum, I requested an extension for submission of the Department of the Interior's comments by email to you on September 23, 2015. Given your schedule for completion of the Record of Decision for OU-1/OU-2, you were unable to grant the NRTs' request for an extension.

Due to the limited time allotted for review of this Technical Memorandum and our concurrent review of the August 2015 draft Baseline Ecological Risk Assessment for Operable Unit 4 (Arcadis 2015), comments for which are due by October 16, 2015, we are unable to provide detailed comments on the Technical Memorandum at this time. However, the Technical Memorandum relies on documents on which the NRTs have previously provided comments, including the ***Streamlined Ecological Risk Assessment for the OU-1/OU-2 portion of Snow Creek, Anniston PCB Site, Anniston, Alabama*** (Arcadis 2013), the ***Technical Memorandum on Remedial Action Objectives, and Remedial Technologies, Alternatives and Screening Operable Unit 1/Operable Unit 2 of the Anniston PCB Site Revision 1*** (Environ 2015) and the ***Remedial Investigation Report for Operable Unit 1/Operable Unit 2 of the Anniston PCB Site*** (Environ 2013). A cursory review of the Technical Memorandum reveals that many of our previous comments were not addressed. For this reason, provision of additional comments on the RI/FS for OU-1/OU-2 would not be productive. I would like to emphasize that the NRTs do not support the results of the Streamlined Ecological Risk Assessment for OU-1/OU-2 or decisions that are subsequently based on that assessment.

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It is important to note that the Alternatives Analysis in the Technical Memorandum does not address the full range of risks to ecological receptors in OU-1/OU-2 that were previously identified by the NRTs (i.e., the risk thresholds applied by Solutia are too high, minimizing the size of the area in which intolerable risks exist). Hence, the Alternatives Analysis does not address many areas within OU-1/OU-2 that have, for example, sediment PCB concentrations between 0.6 and 3.0 mg/kg DW. As a result, the Alternatives Analysis is not complete and should not be used to support remedial decisions at the site.

Thank you for your consideration of our previous comments as you move into the Remediation Phase for OU-1/OU-2. If you have any questions, please feel free to contact me (phone: 205/726-2667; Karen_marlowe@fws.gov).

Sincerely,

Karen W Marlowe

Karen W. Marlowe
USDOI Anniston Case Manager

cc: Amy Horner Hanley, DOI-Solicitor, Washington, D.C.
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MAY 0 7 2015

IN REPLY REFER TO:

Pamela J. Langston Scully
Remedial Project Manager
Superfund Remedial Branch
U.S. Environmental Protection Agency
61 Forsyth Street, SW
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Dear Pam:

Thank you for the opportunity to review the ***Technical Memorandum on Remedial Action Objectives, and Remedial Technologies, Alternatives and Screening Operable Unit 1/Operable Unit 2 of the Anniston PCB Site: Revision 1. Anniston, Alabama***, that was prepared by Environ International Corporation (Environ 2015) on behalf of Solutia Inc. General and detailed comments on the subject draft are provided in this correspondence by the U.S. Department of the Interior (USDOI) in its role as a trustee for natural resources on behalf of the public.

1.0 General Comments

The Remedial Action Objectives (RAOs) Report (Environ 2015) was prepared to support the remedial investigation/feasibility study (RI/FS) for the OU-1/OU-2 portion of the Anniston PCB Site. The document describes the development of RAOs, outlines general response actions and remedial technologies, and presents the results of the screening of remedial alternatives. General comments on the subject draft include:

1. The draft RAO Report (Environ 2015) relies on the Streamlined Ecological Risk Assessment (SERA) for the OU-1/OU-2 Portion of Snow Creek (Arcadis 2013). In its role as a trustee for natural resources, the USDOI provided detailed comments on the Arcadis (2013) SERA document (see Attachments 1A and 1B; USDOI comments on SERA dated March 28, 2013, and July 8, 2013). It appears that DOI comments were not provided in their entirety to Solutia Inc. As a result, the OU-1/OU-2 SERA that was approved by USEPA on January 21, 2015 did not address many of the USDOI comments on the SERA, as specified below. We, therefore, continue to assert that the SERA is not adequate for developing RAOs or screening remedial alternatives for the OU-1/OU-2 portion of the site. Some of the key limitations of the SERA that were identified by USDOI, which are carried over into the draft RAO Report for OU-1/OU-2 Anniston PCB Site, include:

    a. The SERA does not provide a robust or rigorous ecological risk assessment (ERA). A more comprehensive baseline ecological risk assessment (BERA), as would typically be required by USEPA, is needed to support the RI/FS for a site as contaminated and complex as the OU-1/OU-2 portion of the Anniston PCB Site;

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b. Risks to ecological receptors utilizing floodplain and terrestrial habitats were not evaluated. This represents a major limitation of the SERA because risks to wildlife, such as migratory birds, have not been evaluated and therefore remain unaddressed in the draft RAO Report;

c. The chemicals of potential concern (COPCs) that were considered in the SERA represent only a subset of the substances that occur in water, sediments, and/or soils within OU-1/OU-2 at concentrations sufficient to pose risks to ecological receptors;

d. The conceptual site model for the OU-1/OU-2 portion of the Anniston PCB Site is incomplete and requires revision to address exposure of ecological receptors to floodplain soil;

e. The list of assessment endpoints used in the SERA is not complete and does not provide an adequate basis for evaluating risks to ecological receptors;

f. The list of measurement endpoints used in the SERA is not complete and does not provide an adequate basis for evaluating risks to ecological receptors;

g. The sediment risk assessment in the SERA needs to incorporate additional COPCs;

h. The toxicity reference values (TRVs; i.e., toxicity thresholds) that were selected for evaluating risks for sediment-dwelling organisms do not correctly reflect the results of the site-specific investigations conducted by Ingersoll *et al.* (2014) and are, therefore, inappropriate for use in the SERA;

i. Risks to ecological receptors associated with exposure to dioxin-like PCBs, PCDDs, and PCDFs were not evaluated in the SERA; and,

j. The extent of the biologically-active zone (BAZ) defined in the SERA is inadequate and underestimates exposure of sediment-dwelling organisms to COPCs in sediments.

As a result of these limitations in the approach to the SERA, discussed more fully in the attached comments, USDOI concluded that the SERA did not provide an adequate basis for evaluating risks to the ecological receptors that utilize or could utilize aquatic and riparian habitats in the OU-1/OU-2 portion of Snow Creek. Thus, reliance on the results of the SERA for development of the RI for OU-1/OU-2 and associated FS will lead to the selection of a remedy that incompletely addresses the risks to the environment, including natural resources.

2. The draft RAO Report (Environ 2015) relies on the RI Report for OU-1/OU-2 (Environ 2014). USDOI provided detailed comments on the draft RI Report, (USDOI comments on the 2013 draft of the RI Report are attached for the record as Attachment 2). However, many of these comments were not addressed in the RI Report that was approved by USEPA on January 21, 2015. As a result, risks to ecological receptors are understated in the RI Report. Hence, the RI Report should not be used to inform the FS for OU-1/OU-2.

3. The sources of the remedial goal options (RGOs) and underlying assumptions that were used to develop them are not described in Environ (2015). Therefore, it is not possible to conduct an independent evaluation of the accuracy or applicability of the proposed

RGOs. The revised RAO Report should further elucidate the basis on which the proposed RGOs are developed.

4. The PCB RGOs that were proposed for benthic invertebrates in Environ (2015) did not consider the site-specific toxicity data for amphipods and midge, the site-specific bioaccumulation data for oligochaetes, or the site-specific toxicity thresholds for PCBs that were presented in Ingersoll *et al.* (2014). The revised RAO Report should incorporate these toxicity data in developing appropriate RGOs which will be protective of the environment.

5. The ecological RAOs that have been proposed in Environ (2015) are focused largely on mitigating risks to ecological receptors. However, as described earlier, since risks to ecological receptors have not been adequately evaluated in OU-1/OU-2, it is unlikely that RAOs developed to mitigate risks are either comprehensive or adequate. In addition, it is unclear that the proposed RAOs will ensure that ambient water quality criteria (AWQC) or State water quality standards (WQSs) for PCBs will be consistently met in Snow Creek or in downstream areas. Therefore, the magnitude and frequency of exceedance of the AWQC and State WQS, if the proposed RAOs are adopted, need to be described in the RAO Report.

6. The approach to developing RAOs in Environ (2015) is inconsistent with the approach that has been used at other hazardous waste sites (e.g., Calcasieu Estuary, Indiana Harbor). More commonly, the RAOs are developed first to describe the narrative intent of any remedial actions that are undertaken at a site to address risks to human health and/or ecological receptors. Then, numerical PRGs are developed to define the concentrations of contaminants of concern (COCs) that correspond to specific levels of risk to human health and/or ecological receptors. The approach applied by Environ (2015), which combines the RAO with the PRG, makes it very difficult to determine the narrative intent of the RAOs that are proposed.

7. No comments are provided on the portions of the document that relate to human health, including identification of media of concern (MOCs), COCs, areas of interest (AOIs), RAOs, applicable or relevant and appropriate requirements (ARARs), RGOs, or other related topics.

2.0 Comments on Development of Remedial Action Objectives

Based on the information provided in Environ (2015), the RAOs were developed using the preliminary RAOs presented in the RI/FS Work Plan, the information presented in the OU-1/OU-2 RI, human health risk assessment (HHRA), and ERA documents, and an evaluation of potential Federal and State ARARs. According to Environ (2015), the RGOs from the risk assessments were used to develop the RAOs, where appropriate. Comments on this section of the subject draft include:

1. RAOs that describe the narrative intent of any remedial actions that may be implemented in OU-1/OU-2 were not clearly articulated in Environ (2015). The revised

RAO Report should clearly articulate the narrative intent of the RAOs for each media type. For this reason, USDOI proposes the following RAOs for MOCs in OU-1/OU-2:

a. The RAO for sediments in OU-1/OU-2 is intended to minimize exposure to sediments that are sufficiently contaminated by PCBs and/or other COCs to pose moderate risks to benthic invertebrates, fish, birds or mammals (i.e., exceedances of low-risk thresholds should be minimized) and to prevent exposure to sediments that are sufficiently contaminated by PCBs and/or other COCs to pose high risks to benthic invertebrates, fish, birds or mammals (i.e., exceedances of high-risk thresholds should be prevented);

b. The RAO for soil in OU-1/OU-2 is intended to minimize exposure to floodplain soils that are sufficiently contaminated by PCBs and/or other COCs to pose moderate risks to terrestrial plants, soil invertebrates, birds or mammals (i.e., exceedances of low-risk thresholds should be minimized) and to prevent exposure to floodplain soils that are sufficiently contaminated by PCBs and/or other COCs to pose high risks to terrestrial plants, soil invertebrates, birds or mammals (i.e., exceedances of high-risk thresholds should be prevented); and,

c. The RAO for biological tissues in OU-1/OU-2 is intended to minimize exposure to invertebrate and fish tissues that are sufficiently contaminated by PCBs and/or other COCs to pose moderate risks to fish, birds or mammals (i.e., exceedances of low-risk thresholds should be minimized) and to prevent exposure to invertebrate and fish tissues that are sufficiently contaminated by PCBs and/or other COCs to pose high risks to fish, birds or mammals (i.e., exceedances of high-risk thresholds should be prevented).

2. Floodplain soils were not identified as a MOC for ecological receptors. This is inappropriate because many ecological receptors will be exposed to floodplain soils within OU-1/OU-2. USDOI is particularly concerned about the failure to evaluate risks to migratory birds associated with exposure to contaminated soils and associated prey species present in floodplain soils.

3. Environ (2015) presents background levels of arsenic based on the results of a study conducted at Fort McClellan (SAIC 1998). Using this information, Environ (2015) concluded that background levels of arsenic in soil in the vicinity of the Anniston PCB Site average 8 mg/kg. However, soil chemistry data collected by the Natural Resource Trustees (NRTs) indicate that levels of arsenic in floodplain soils within the study area (potentially affected by discharges from the facility) are substantially lower than those than have been observed at Fort McClellan (median < 4.0 mg/kg) (MacDonald *et al.* unpublished data). A summary of the arsenic data collected by the NRTs for floodplain soils in OU-4 is attached as Table 1 for your reference (Attachment 3). Background levels of arsenic in floodplain soils within the study area will be similar to or lower than those measured in the NRT study. Therefore, arsenic needs to be retained as a COPC.

4. Section 2.1.2 (Sediment) describes the distribution of sediments with PCB concentrations greater than 5 mg/kg. No rationale is provided for describing the distribution of sediments with these chemical characteristics. More appropriately, the

distribution of sediments with PCB concentrations that exceed the low risk and the high risk toxicity thresholds for each of the receptor groups should be described in the document.

5. While RGOs were developed for floodplain soils that would be protective of human health, RGOs were not developed for ecological receptors that are likely to be exposed to floodplain soils (e.g., terrestrial plants, soil invertebrates, birds, or mammals). This represents a major limitation of the subject draft and raises doubts about the level of protection the remedy will offer for the environment.

6. The sources of the ecological RGOs and underlying assumptions that were used to develop them are not described in Environ (2015). Therefore, it is not possible to conduct an independent evaluation of the accuracy or applicability of the RGOs presented in Table 2-6 or 2-7. The revised draft should articulate the assumptions that were applied to develop the ecological RGOs and explain how the ecological RGOs were derived.

7. The PCB RGOs that were proposed for benthic invertebrates in Table 2-8 did not consider the site-specific toxicity data for amphipods and midge, the site-specific bioaccumulation data for oligochaetes, or the site-specific toxicity thresholds for PCBs that were presented in Ingersoll *et al.* (2014). If selected as RAOs, the RGOs for benthic invertebrates presented in Environ (2015) would result in adverse effects on the benthic invertebrate community, including adverse effects on the reproduction of sensitive invertebrate species. The revised RAO Report should incorporate these toxicity data in the development of RGOs that will be protective of the environment.

8. While RAOs were developed to mitigate human health risks associated with exposure to floodplain soils, RAOs were not developed to mitigate risks to ecological receptors associated with exposure to floodplain soils. This represents a major limitation of the subject draft and raises doubts about the level of protection the remedy will offer for the environment.

9. The RAO for sediment is to "Mitigate ecological risks to the OU-1/OU-2 portion of Snow Creek with an ecologically based RAO of 10 mg/kg" of PCBs in sediment. Based on the information presented in Table 2-6 in Environ (2015), of the seven species identified in the table, the selected RAO would be protective of only three: the muskrat, mallard, and pied-billed grebe. The selected RAO would not be protected of the other four species listed in the table: the tree swallow, spotted sandpiper, little-brown bat, or raccoon. Therefore, it is unlikely that the proposed RAO would be protective of migratory birds or other natural resources utilizing habitats within the OU-1/OU-2 portion of the site. An RAO that is protective of thesenatural resources should be selected.

10. Selection of 10 mg/kg PCBs as the RAO for sediment would not be protective of aquatic life, such as benthic invertebrates. The following PRGs for PCBs represent levels that pose low and high risks to benthic invertebrates utilizing streambed habitats in the OU-1/OU-2 portion of the Anniston PCB Site (Ingersoll *et al.* 2014):

- Low-risk PRG: 0.499 mg/kg DW of tPCBs; and
- High-risk PRG: 1.18 mg/kg DW of tPCBs.

11. No evidence is provided to demonstrate that an RAO of 10 mg/kg PCBs would be sufficient to minimize Snow Creek sediments or creek bank soils as potential sources of PCBs to Snow Creek. This is a concern because effects thresholds for many ecological receptors are below 10 mg/kg of PCBs. Therefore, downstream transport of sediments or creek bank soils with PCB concentrations greater than effects thresholds has the potential to result in increased risks to ecological receptors in downstream areas. In addition, selection of an RAO of 10 mg/kg PCBs is unlikely to minimize the frequency and magnitude of ambient water quality criteria exceedances for PCBs in the OU-1/OU-2 portion of Snow Creek or downstream areas. Rather, there is evidence to support the selection of a lower RAO to be protective of the environment.

3.0 Comments on General Response Action and Remedial Technologies

This section of the subject document (Environ 2015) was not reviewed by the USDOI technical review team. Accordingly no comments are provided on this section of the document.

4.0 Comments on Screening of Remedial Alternatives

This section of the subject document (Environ 2015) was not reviewed by the USDOI technical review team. Accordingly no comments are provided on this section of the document.

5.0 Summary and Conclusions

The USDOI technical review team reviewed portions of the document entitled, ***Technical Memorandum on Remedial Action Objectives, and Remedial Technologies, Alternatives and Screening Operable Unit 1/Operable Unit 2 of the Anniston PCB Site: Revision 1. Anniston, Alabama.*** The results of this review indicate that the proposed RAOs are unlikely to provide an adequate level of protection for the environment, including natural resources and their services under the jurisdiction of Federal and or State trustees. Accordingly, an evaluation of remedial alternatives using the proposed RAOs is unlikely to result in the selection of a remedy that will adequately address risks to ecological receptors. As such, any injuries to natural resources located within OU-1/OU-2 may persist into the future, resulting in ongoing ecological service losses and associated injuries that will need to be addressed in the natural resource damage assessment and restoration (NRDAR) process. The NRTs recommend application of RAOs and PRGs that would be protective of trust natural resources to minimize ecological service losses during remedy implementation and thereafter. The NRTs are willing to further discuss the approach to PRG and remedy selection at our mutual convenience.

Thank you for the opportunity to review this draft document. USDOI looks forward to reviewing the next draft prior to it becoming final.

Sincerely,

Karen W Marlowe

Karen W. Marlowe
USDOI Anniston Case Manager

cc: Amy Horner Hanley, DOI-Solicitor, Washington, D.C.
Greg Masson, USFWS Atlanta, GA
Will Brantley, ADCNR, Montgomery, AL
Marlon Cook, GSA, Tuscaloosa, AL
Will Gunter, General Counsel, ADCNR, Montgomery, AL
Bill Weinischke, DOJ, Washington, D.C.
Davis Forsythe, DOJ, Denver, CO
Rudy Tanasijevich, EPA Solicitor, Atlanta, GA

Attachment 1a: March 28, 2013 USDOI comments on the 2013 SERA
Attachment 1b: July 8, 2013 USDOI comments on the 2013 SERA
Attachment 2: April 15, 2013 USDOI comments on the 2013 RI
Attachment 3: Arsenic data for floodplain soils in OU-4

References Cited

Arcadis. 2013. Streamlined Ecological Risk Assessment (SERA) for the OU-1/OU-2 portion of Snow Creek. Prepared for Pharmacia LLC and Soluita Inc.

ENVIRON International Corporation. 2014. Remedial investigation report of Operable Unit 1/Operable Unit 2 of the Anniston PCB Site. Revision 3. Prepared for Solutia Inc.

ENVIRON International Corporation. 2015. Technical memorandum on remedial action objectives, and remedial technologies, alternatives and screening Operable Unit 1/Operable Unit 2 of the Anniston PCB Site. Revision 1. Prepared for Solutia.

Ingersoll, C.G., J.A. Steevens, and D.D. MacDonald (editors). 2014a. Evaluation of toxicity to the amphipod, *Hyalella azteca*, and to the midge, *Chironomus dilutus*; and bioaccumulation by the oligochaete, *Lumbriculus variegatus*, with exposure to PCB-contaminated sediments from Anniston, Alabama. United States Geological Survey Scientific Investigations Report 2013–5125, 122 p. (http://pubs.usgs.gov/sir/2013/5125/).

SAIC. 1998. Background metals survey report, Fort McClellan. Final. Prepared for the U.S. Army Corps of Engineers. Mobile District by Science Applications International Corporation. July. (As cited in ENVIRON 2015).

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1208-B Main Street
Daphne, Alabama 36526

IN REPLY REFER TO

April 16, 2013

Pamela J. Langston Scully
Remedial Project Manager
Superfund Remedial Branch
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Scully:

As we discussed on our April 11, 2013, Anniston CERCLA/NRDAR Coordination Group conference call, I am herewith transmitting the following items:

- Department of the Interior's (DOI) preliminary comments on the February 2013 *Remedial Investigation Report for Operable Unit 1 Operable Unit 2 of the Anniston PCB Site*, prepared by ENVIRON International Corporation (Environ 2013); and,

- An updated Toxicity Reference Value (TRV) table.

Also, as requested, following is some further explanatory text for Comment 3 on page 8 of DOI's March 28, 2013, comments on the *Streamlined Ecological Risk Assessment for the OU-1 OU-2 portion of Snow Creek, Anniston PCB Site, Anniston, Alabama* (SERA):

> "Page 5 in Appendix B also states that the repeated testing of Sample 20 (2.5 months apart) also illustrates high variability. However, Ingersoll *et al.* (2013) demonstrated that relatively low variability was observed in the repeated testing of this sediment (in contrast to the conclusion in the Arcadis (2013) report that variability was high: e.g., 6 of 12 endpoints were within 20%)." More specifically, "Sediment 20 was tested in cycle 1a and retested in cycle 1b with *C. dilutus* by USGS-Columbia to determine repeatability of effects observed across storage time between the start of cycle 1a and the start of cycle 1b. **Percent survival was high in both cycles of testing (cycle 1a = 85.4 percent; cycle 1b = 97.9 percent) and mean total biomass at day 13 was similar in both cycles (cycle 1a = 9.61 mg; cycle 1b = 10.12 mg). Percent emergence and adult biomass also were similar between cycles of testing (for example, percent emergence in cycle 1a = 54.2 percent, in cycle 1b = 62.5 percent).** Whereas the mean number of egg cases produced in cycle 1b (3.8) was greater than that for cycle 1a (1.6), the mean number of eggs produced per egg case was similar (cycle 1a = 982.2; cycle 1b = 992.2), as was hatching percentage (cycle 1a = 98.4 percent; cycle 1b = 93.6 percent). Because of the overall

greater number of egg cases produced in cycle 1b, the mean total number of young produced also was higher in cycle 1b (3,461.6, 84.7 percent of the control response) relative to cycle 1a (1,610.8, 52.3 percent of the control response). Hence, Ingersoll *et al.* (2013) concluded that repeated testing of Sample 20 illustrated low variability, particularly for critical endpoints (Day 13 survival, weight and biomass, and adult biomass and emergence). For example, emergence varied by only 14% and 13-d biomass varied by only 5%.

Please let me know if you have any questions.

Sincerely,

Karen W. Marlowe

Karen W. Marlowe
Anniston PCB NRDAR Case Manager

Enclosures

cc: Amy Horner, DOI-Solicitor, Washington, D.C.
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Will Brantley, ADCNR, Montgomery, AL
Marlon Cook, GSA, Tuscaloosa, AL
Will Gunter, General Counsel, ADCNR, Montgomery, AL
Bennett Bearden, Assistant Attorney General, GSA, Tuscaloosa, AL
Bill Weinischke, DOJ, Washington, D.C.
Davis Forsythe, DOJ, Denver, CO
Rudy Tanasijevich, EPA Solicitor, Atlanta, GA

U.S. Department of the Interior
Preliminary Comments on Remedial Investigation Report for OU-1/OU-2 of the Anniston PCB Site

The U.S. Department of the Interior (USDOI) did not conduct a comprehensive review of the *Remedial Investigation Report for Operable Unit 1/Operable Unit 2 of the Anniston PCB Site*, which was prepared for Solutia Inc. by Environ International Corporation (Environ 2013) (Report). A comprehensive review of this document was not conducted by USDOI because the Streamlined Ecological Risk Assessment (SERA) for OU-1/OU-2 had numerous problems and deficiencies that rendered it inappropriate for assessing risks to ecological receptors in OU-1/OU-2 and because the remedial investigation (RI) depends on the results of the SERA. Accordingly, the issues and concerns related to the SERA also apply to Section 6.2 and, potentially, other sections of the Environ (2013) Report. Nevertheless, USDOI is pleased to offer the following preliminary comments on the Report [however, it is important to note that the absence of comments on specific sections of Environ (2013) does not denote USDOI concurrence with the information presented or the associated conclusions]:

- Section 2.6 (Habitat Conditions) - USDOI does not agree with the characterization of habitat values in OU-1/OU-2. Aquatic and floodplain habitats in OU-1/OU-2 provide essential services to ecological receptors that occur in the area, including invertebrates, fish, birds, and mammals. Hence, risks to receptors utilizing these habitats need to be evaluated;
- Section 3 (OU-1/OU-2 Investigations and Remedial Actions) - USDOI did not conduct a detailed review of this section;
- Section 4.1 (Floodplain Soils) - The discussion of the nature and extent of contamination of surface and sub-surface floodplain soils is artificially limited to PCBs. In addition, the soil chemistry data presented in Tables 3-1, 3-2, and 3-3 is limited to PCBs. While Table 3-4 presents soil chemistry data for a broader list of COPCs, these results are not discussed in the Report. Therefore, Environ (2013) does not evaluate the nature of contamination of floodplain soils. In addition, the spatial extent of contamination is only incompletely evaluated, in that only the spatial distribution of PCBs was evaluated. This represents a major deficiency of Environ (2013);
- Section 4.2 (Sediment) - The discussion of the nature and extent of contamination of OU-1/OU-2 sediment is artificially limited to PCBs. In addition, the sediment chemistry data for Snow Creek presented in Tables 3-5 and 3-6 is limited to PCBs. While Tables 3-7 and 3-8 present sediment chemistry data for a broader list of COPCs, these results are not discussed in the Environ (2013) report. Only four sediment samples were collected to evaluate contamination by most other COPCs, from a stream section that is more than 5 kilometers (3 miles) in length. It would be more appropriate to collect and evaluate a similar number of samples as was done for PCBs (i.e.,

approximately 70). Therefore, Environ (2013) does not evaluate the nature of contamination of OU-1/OU-2 sediments. In addition, the spatial extent of contamination is only incompletely evaluated, because only one sample was collected between the Rt. 202 culvert point and Highway 78 to evaluate non-PCB COPCs. This represents a major deficiency of Environ (2013);

- Section 4.3 (Surface Water) - The discussion of the nature and extent of contamination of surface water in OU-1/OU-2 is artificially limited to PCBs. In addition, the chemistry data for Snow Creek presented in Table 3-9 is limited to particulate total PCBs (i.e., aqueous concentrations were not presented). While Table 3-10 presents surface water chemistry data for a broader list of COPCs, these results are not discussed in the Report. Therefore, Environ (2013) does not evaluate the nature of contamination of surface water in OU-1/OU-2. In addition, the spatial extent of contamination is only incompletely evaluated because surface water samples were collected at only one location;
- Sections 4.4 and 4.5 (Groundwater and Air) - USDOI did not conduct a detailed review of Sections 4.4 and 4.5; hence, no comments are offered on these sections of Environ (2013);
- Section 4.6 (COPCs for OU-1/OU-2) - The criteria presented in Section 4.6 for identifying COPCs in OU-1/OU-2 are not appropriate. The COPCs that need to be brought into the SERA include any and all substances that have been measured in surface water, sediment, floodplain soils, and/or biological tissues at concentrations that exceed toxicity screening values (TSVs). On June 21, 2012, USDOI provided USEPA with detailed comments on the COPC refinement that was conducted by Solutia/Pharmacia. The approach used by Environ (2013) to identify COPCs in OU-1/OU-2 is not consistent with either the DOI comments or U.S. Environmental Protection Agency (EPA) guidance. Changes to the COPCs in the SERA consistent with USDOI comments and EPA guidance need to be carried through to the revisions of the Report;
- Section 5 (Contaminant Fate and Transport) - The section on contaminant fate and transport presented in Environ (2013) is artificially limited to PCBs. As there are a number of COPCs in surface water, sediment, floodplain soils, and biological tissues within OU-1/OU-2 the discussion of contaminant fate and transport is not sufficient. Furthermore, the discussions of the relative importance of various transport pathways appear to be insufficient—omitting potentially significant pathways (i.e., neither sediments nor floodplain soils were identified as significant migration pathways for PCBs). Further, aquatic and riparian food webs were not identified as important migration pathways for PCBs and they should be;
- Section 6 (Baseline Risk Assessments) - USDOI did not conduct a detailed review of the human health risk assessment. Therefore, no comments are offered on this section of the Report; and,
- Section 7 (Summary and Conclusions) - USDOI conducted a preliminary review of the summary and conclusions of the RI and disagrees with many of the conclusions that were

reached regarding the nature and extent of contamination, fate and transport of PCBs, and risks to ecological receptors (please refer to our March 28, 2013, letter providing comments on the draft SERA). As the conclusions relative to ecological risks are incorrect in Environ (2013) (i.e., as indicated by the use of inappropriate TRVs in the risk assessment, and underestimation of the value of habitats with OU-1/OU-2 to the receptors present in those areas), the next steps that are identified in that section (Section 7.2) need to be restated once Environ (2013) is revised. Finally, the recommended remedial action objectives (RAOs) presented in Section 7.3 are not sufficient to guide the selection of remedial options under the Feasibility Study (FS) (the term "address" is meaningless in an RAO). Therefore, the RAOs need to be revised to make clear what the goals of the remedy will be.

Attach 3

Table 1. Summary of arsenic data collected by the NRTs for floodplain soils in the OU-4 study area (2013).

Station ID	Northing	Easting	Sample ID	Arsenic Concentration (mg/kg DW)
SL-CC01-01	3719439.459	609022.4093	SL-CC01-01_P	10.7
SL-CC01-02	3719423.583	609059.8905	SL-CC01-02_P	4.23
SL-CC01-03	3719363.001	609047.1242	SL-CC01-03_P	4.3
SL-CC01-04	3719371.129	609030.5155	SL-CC01-04_P	4.22
SL-CC01-05	3719308.723	609003.5729	SL-CC01-05_P	4.47
SL-CC01-06	3719212.918	609033.6111	SL-CC01-06_P	4.43
SL-CC01-07	3719467.116	609055.5917	SL-CC01-07_S	3.77
SL-CC01-08	3719409.724	609099.2047	SL-CC01-08_S	4.23
SL-CC01-09	3719397.402	609000.432	SL-CC01-09_S	3.55
SL-CC01-10	3719271.035	608975.6998	SL-CC01-10_S	4.35
SL-CC01-11	3719285.127	609064.3396	SL-CC01-11_S	4.31
SL-CC01-12	3719206.147	609072.1032	SL-CC01-12_S	4.84
SL-CC01-13	3719084.383	609003.5214	SL-CC01-13_S	4.32
SL-CC01-14	3719059.044	609232.9123	SL-CC01-14_S	5.19
SL-CC01-15	3719278.659	609149.0374	SL-CC01-15_S	5.27
SL-CC01-16	3719288.751	609236.7945	SL-CC01-16_S	5.14
SL-CC01-17	3719135.966	609599.3052	SL-CC01-17_S	4.61
SL-CC02-02	3718693.72	609053.8895	SL-CC02-02_P	2.79
SL-CC02-03	3718623.846	608974.7855	SL-CC02-03_P	4.27
SL-CC02-04	3718596.703	608869.5841	SL-CC02-04_P	3.45
SL-CC02-05	3718633.101	609047.7109	SL-CC02-05_P	3.4
SL-CC02-06	3718597.247	609161.7008	SL-CC02-06_P	5.02
SL-CC02-07	3718485.603	609095.7843	SL-CC02-07_P	4.94
SL-CC03-01	3716483.771	607325.3053	SL-CC03-01_S	3.82
SL-CC03-02	3716539.731	607093.0133	SL-CC03-02_P	10.8
SL-CC03-03	3716429.796	607049.5936	SL-CC03-03_P	3.07
SL-CC03-05	3716533.441	605995.3593	SL-CC03-05_P	3.89
SL-CC03-06	3716628.005	605932.5951	SL-CC03-06_S	2.96
SL-CC03-07	3716527.998	607065.021	SL-CC03-07_P	8.29
SL-CC03-08	3716431.138	606970.8705	SL-CC03-08_P	3.26
SL-CC03-09	3716698.956	606111.6852	SL-CC03-09_S	2.46
SL-CC03-10	3716724.357	605849.5262	SL-CC03-10_S	2.58
SL-CC04-01	3716429.842	605842.1492	SL-CC04-01_P	4
SL-CC04-02	3716584.615	605698.0677	SL-CC04-02_S	3.08
SL-CC04-04	3715734.874	605164.6801	SL-CC04-04_P	3.22
SL-CC04-05	3715778.802	605064.6019	SL-CC04-05_P	5.93
SL-CC04-06	3715699.123	604957.7986	SL-CC04-06_P	3.84
SL-CC04-09	3716571.148	602197.3813	SL-CC04-09_P	3.4
SL-CC04-10	3716529.882	602248.1248	SL-CC04-10_P	3.05
SL-CC04-11	3715665.813	604994.456	SL-CC04-11_S	3.75
SL-CC04-17	3716601.27	602162.2563	SL-CC04-17_S	3.34
SL-CC04-18	3716580.449	602362.7675	SL-CC04-18_S	2.93
SL-CC07-02	3713803.902	591482.8397	SL-CC07-02_P	2.84
SL-CC07-05	3713823.915	591106.9825	SL-CC07-05_P	4.24
SL-CC07-06	3713997.983	590901.1589	SL-CC07-06_P	3.15

Table 1. Summary of arsenic data collected by the NRTs for floodplain soils in the OU-4 study area (2013).

Station ID	Northing	Easting	Sample ID	Arsenic Concentration (mg/kg DW)
SL-CC07-07	3714328.091	590971.4675	SL-CC07-07_P	6.71
SL-CC07-08	3714908.418	590965.8853	SL-CC07-08_P	16
SL-CC07-09	3711705.256	588528.6572	SL-CC07-09_P	2.55
SL-CC07-10	3713856.957	591464.9751	SL-CC07-10_P	2.42
SL-CC07-11	3713827.356	591091.5968	SL-CC07-11_S	3.82
SL-CC07-12	3714578.58	591123.3773	SL-CC07-12_S	9.43
SL-CC07-13	3714961.48	591206.168	SL-CC07-13_S	10.1
SL-CC08-01	3711408.345	588158.3813	SL-CC08-01_P	3.89
SL-CC08-02	3711366.951	588094.0389	SL-CC08-02_P	3.63
SL-CC08-03	3712181.74	586874.8089	SL-CC08-03_P	3.56
SL-CC08-06	3711619.649	588443.8322	SL-CC08-06_S	3.78
SL-CC09-01	3711935.851	584577.3913	SL-CC09-01_P	2.17
SL-CC09-02	3712298.77	584159.4555	SL-CC09-02_P	3.8
SL-CC09-04	3712208.488	584270.9194	SL-CC09-04_S	3.01
SL-CC10-01	3714904.73	580370.6366	SL-CC10-01_P	3.65
SL-CC10-02	3714719.071	580339.2365	SL-CC10-02_P	3.53
SL-CC10-03	3714490.633	580243.9579	SL-CC10-03_P	1.89
SL-CC10-04	3714933.403	579806.0518	SL-CC10-04_P	3.93
SL-CC10-05	3714774.566	579919.8696	SL-CC10-05_P	1.01
SL-CC10-06	3714290.878	579529.8428	SL-CC10-06_P	3.97
SL-CC10-07	3712966.209	579306.7484	SL-CC10-07_P	10.5
SL-CC10-08	3712925.081	579280.9996	SL-CC10-08_P	21.4
SL-CC10-09	3713188.599	576522.2486	SL-CC10-09_P	4.21
SL-CC10-10	3712880.115	579273.9429	SL-CC10-10_S	10.3
SL-CC10-11	3714671.863	576675.486	SL-CC10-11_S	7.66
SL-CR02-02	3710403.118	576462.3973	SL-CR02-02_P	7.89
SL-CR02-03	3710462.672	576407.8789	SL-CR02-03_P	7.95
SL-CR02-05	3712753.834	576647.7905	SL-CR02-05_S	2.99
SL-CR02-06	3710344.83	576508.7344	SL-CR02-06_S	4.74
SL-CR02-08	3713008.859	575242.712	SL-CR02-08_P	4.22
SL-SC01-01	3723337.428	606459.5463	SL-SC01-01_P	2.01
SL-SC01-02	3723551.85	606708.1993	SL-SC01-02_P	2.03
SL-SC01-03	3723957.273	606894.1972	SL-SC01-03_P	5.45
SL-SC01-04	3724013.476	606869.4721	SL-SC01-04_P	8.56
SL-SC01-05	3723375.415	606606.3892	SL-SC01-05_S	2.87
		Minimum		**1.01**
		Maximum		**21.4**
		Mean		**4.87**
		Standard Deviation		**3.14**
		Median		**3.91**

Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:19 AM
To: Pearce, Jennifer
Subject: FW: TA comments on RA
Attachments: Part 1 of 4 RA DOCUMENT.doc

From: Scully, Pam
Sent: Monday, June 13, 2016 7:04 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: TA comments on RA

From: Bertrand Thomas [mailto:bertrandthomas10@att.net]
Sent: Wednesday, May 11, 2016 11:11 AM
To: Scully, Pam
Subject: TA comments on RA

Hello Pam, There are four parts to this document because of the size of the file.

The Technical Advisor Comments on The US EPA Remedial Alternatives for The Anniston PCBs Site

Anniston PCBs OU-1/OU-2 Remedial Alternatives Comments

To aid in the understanding of the OU-1/OU-2 Remedial Alternatives document, the TA has provided some additional information:

- **Preliminary Remediation Goal (PRGs)**: It is the clean up level that the EPA has determine to be protected of human Health and the environment. It is base on The Remedial Investigation, Agency for Toxic Substances and Disease Registry (ATSDR), Toxic Substance Control Act (TSCA), Food and Drug Agency (FDA), the contaminant, Mode of Transport, Communities Activities, etc.
- One of the main factors in determining PRGs is the Cancer Risk =1x**10^{-6}**
- **This means one person out of a million may develop cancer from being exposed to a chemical or chemicals.**
- **While 1x10^{-4} means: One in Ten Thousand people may develop cancer.**
- **In the report you will see a number and a unit: example**

  10 mg/kg = 10ppm (means the same)
- **Toxic Substances Control Act (TSCA) Self-Implementing (40 CFRξ761.61(a)**
- **High occupancy-Soil**
  a) **< 1ppm total PCBs- no restrictions**
  b) **1-10ppm total PCBs- cap and deed restriction**
- **Low occupancy – Soil**
  a) **<25ppm total PCBs-deed restriction**

b) **<50ppm total PCBs-specific marker, fence, and deed restriction**

c) **<100ppm-cap and deed restriction**

(Deb Mackenzie-Taylor, November, 2015, TSCA PCBs, Remediation-The Coordinated Approval Process, Michigan department Environmental

Quality, 517-614-7333, Mackenzie-Taylor@Michigan.gov

Residential Soils

The EPA comparative analysis of: the Remedial Alternatives is to address the residuals PCBs in residential soils; to address citizens who were denied access for the remediation their property; to address citizen who own property with overgrown vegetation and has PCB in soil concentrations between 1ppm and 10ppm; and to address citizens who have property with overgrown vegetation less than 1ppm of PCBs in soil. Figure 1 depicts Residential Property that with PCBs concentrations 1ppm to 10ppm with the top 12 inches on property. Also there are Hot Pots with concentration above 10ppm.

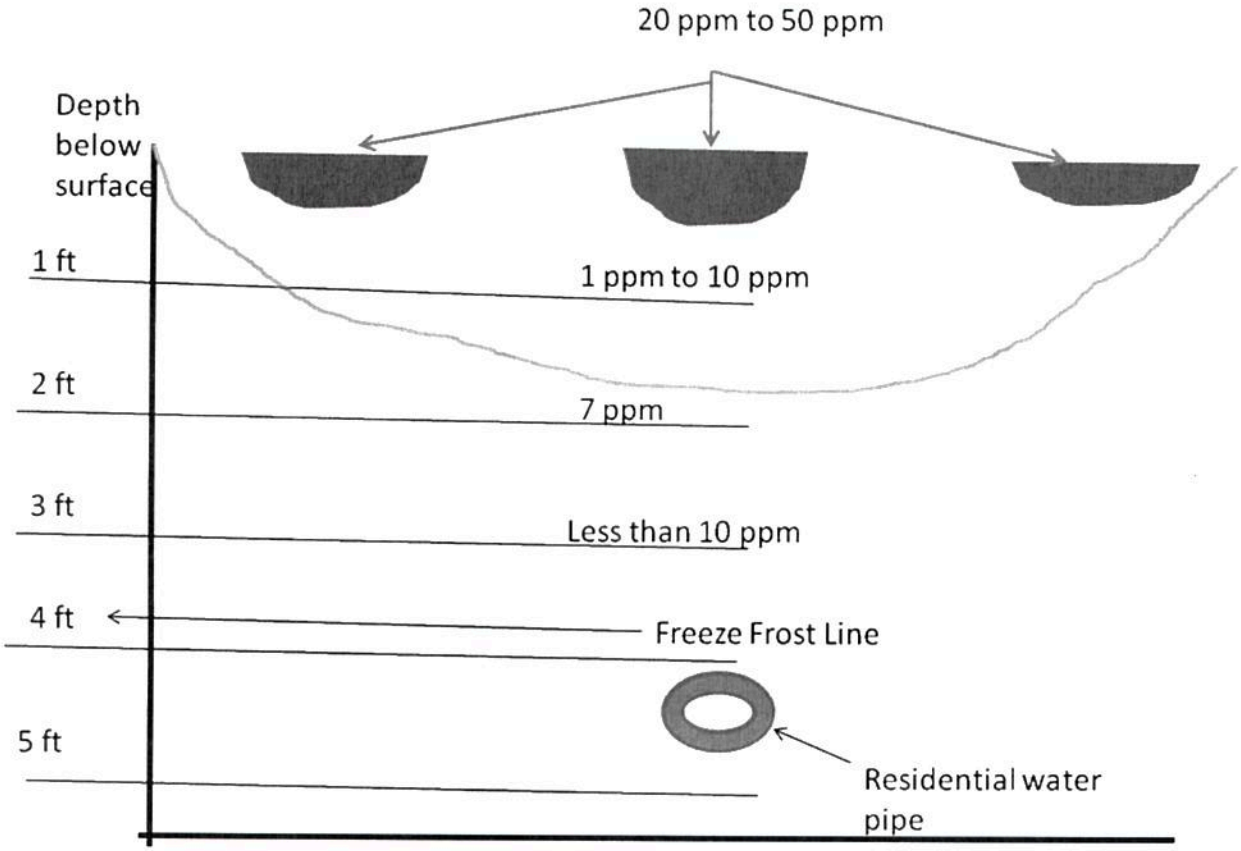


Figure 1: Residential Property

The EPA's Remedial Alternative is to adopt the NTC Agreement. Excluding alternative number one, the no action alternative, which is a required alternative in all remediation projects, the EPA's risk alternative is to meet the preliminary remediation goal (PRG) for Residential Soil and to:

2 Excavation and On-Site/Off-Site disposal of residential Soils with surface Soil PCB concentrations 1≥ ppm and Subsurface soil PCB concentrations ≥ 10 ppm and Soil Management. (Part of Remedial Alternative: Additional removal actions would be implemented for properties if access is granted or if overgrown conditions change. Soil generated during additional removal may be disposed of on-site in the south staging and soil management area (SSSMA) provide that the PCBS concentration results from the five-point composite samples collected for the property are <10ppm) . Figure 2 Depicts Residential Property After NTC Agreement Clean-up.

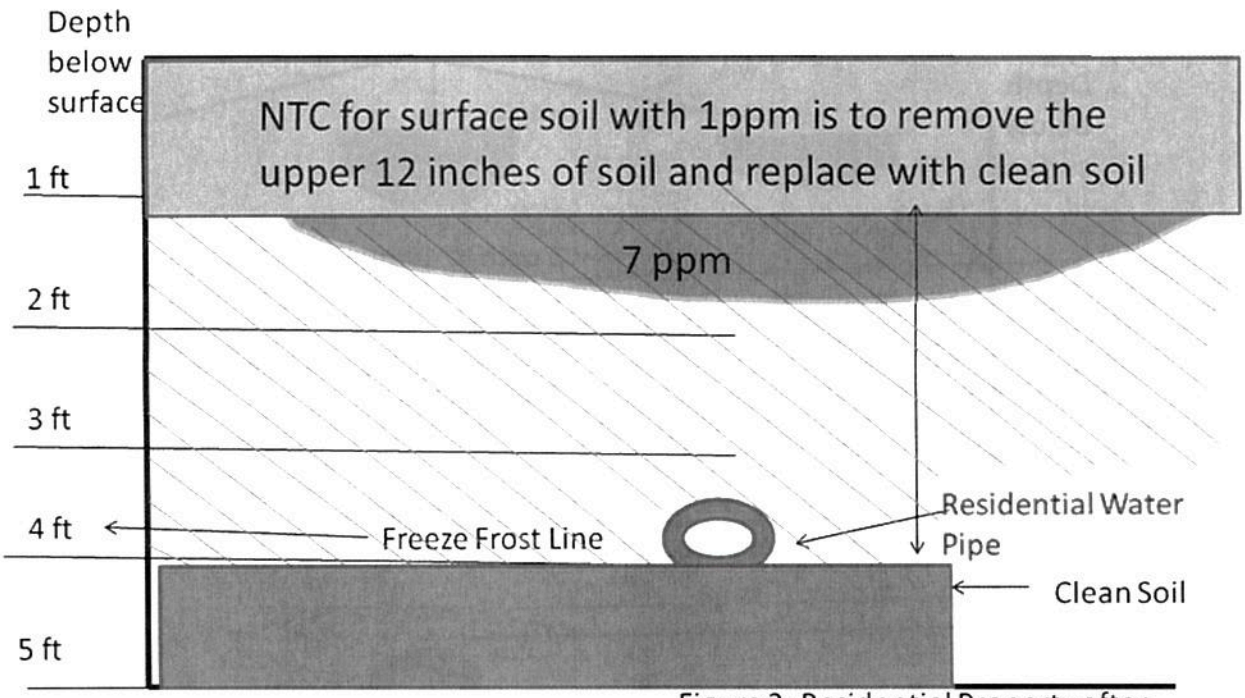


Figure 2: Residential Property after NTC Agreement Clean-Up

3. Excavation and On-Site/Off-Site disposal of residential Soils with surface and subsurface soil PCB concentrations 1≥ .(Removed the previously placed 12 inch layer of clean backfill, excavating deeper to achieve 1ppm to a depth of 48 inches (4ft.), and backfilling and restoring the Soil generated during the additional removals may be disposed of in the SSSMA if the PCB concentrations of the composite samples are Lee Than < 1ppm).

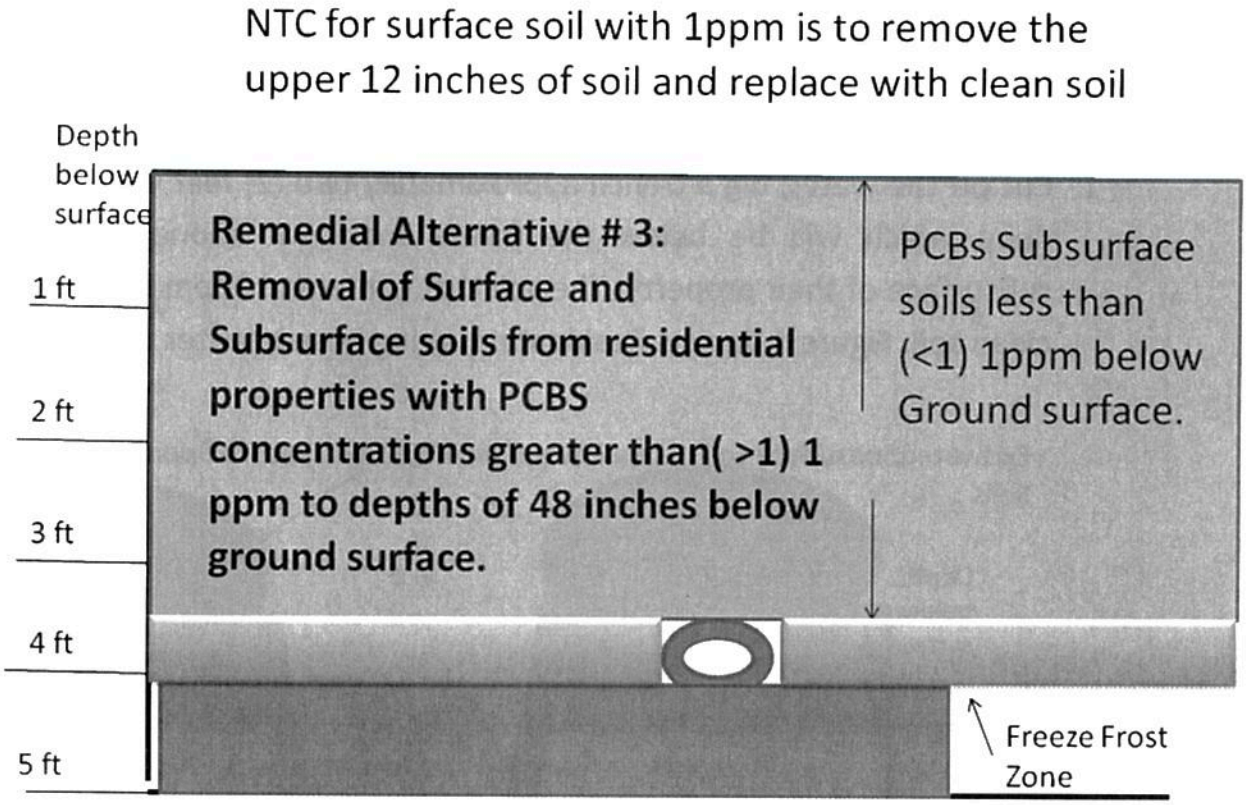


Figure 3: Residential Remedial Alternative #3

The Agreement in the NTC for surface soil with 1ppm is to remove the upper 12 inches of soil and replace with clean soil. The result of this action reduces the concentration on residential properties below 1ppm, which is also the concentration that can be detected in any urban City across the United States according to the EPA and ATSDR publications, USEPA, 2007. The second part of the NTC addressed soil on residential properties above 10ppm in subsurface soil. The NTC Agreement action reduces the subsurface soil, soil below the one foot of clean soil cover, to a concentration below 10ppm. The NTC Agreement leaves a number of residential properties (approximately 97 properties) with a maximum concentration of 9ppm, one foot below the remediate surface soil, in the subsurface soil. The NTC Agreement was an interim action to address residential properties until a final Record Of Decision (ROD) was in place.

The EPA proposed to move the NTC Agreement forward to the Final EPA Remedial Alternatives. The community has been asked to comment on this approach. TA has brought forth the discussion on recontamination by using the scenario of a

Busted Water Pipe in the middle of a cold snowed winter night, and what a person would do in that situation. A person may do the follows:

1. Cut off the water; dig a trench approximately two (2) feet wide by five feet deep which will be below the freeze frost line (Zone) and into the subsurface of their property. The soil that contained 9ppm is now on top of clean soil. Figure 4 depicts Resident repairing busted water pipe.

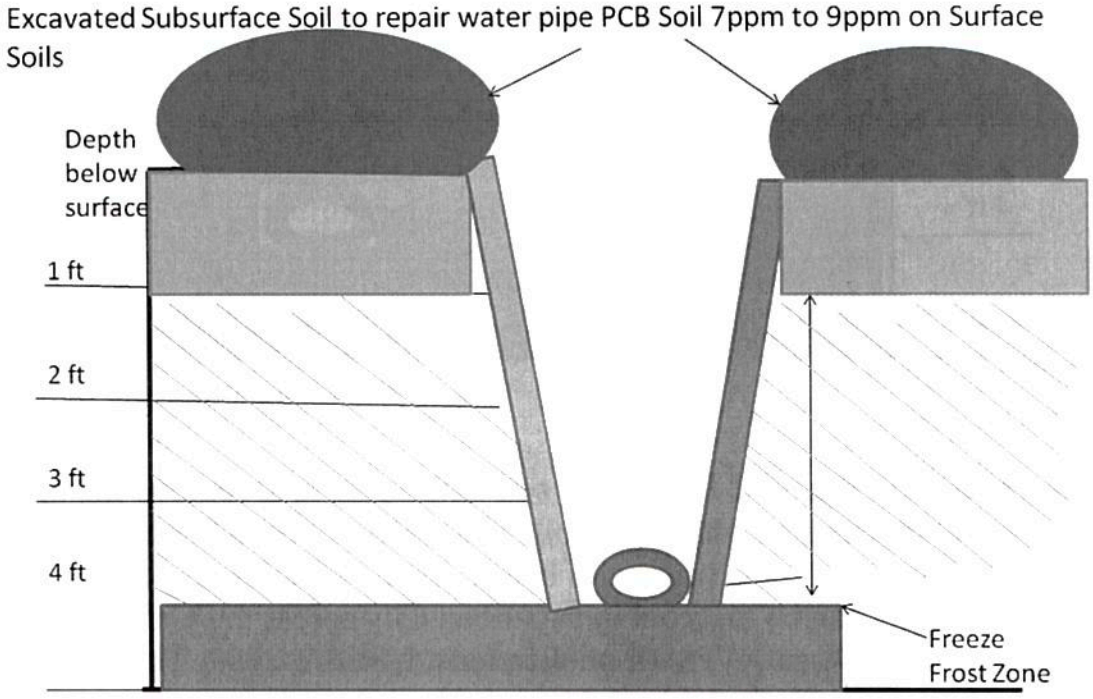


Figure 4: Resident Excavating to Repairing Busted Water Pipe

2. The next morning, the children are out playing in the excavated soil that contains the 9ppm. The soil is now on their clothes, shoes, and exposed body parts. The children enter into their home and begin playing with their younger sibling. The young child crawls or walks on the floor where the 9ppm soil residuals have been brought in by the children who were playing outside in the excavated soil. ATSDR states that children should be discouraged from playing in dirt that contains PCBs, (ATSDR, 2014, Bullet 3). Figure 5 depicts small child playing in Soils containing up PCBs concentrations up to 9ppm.

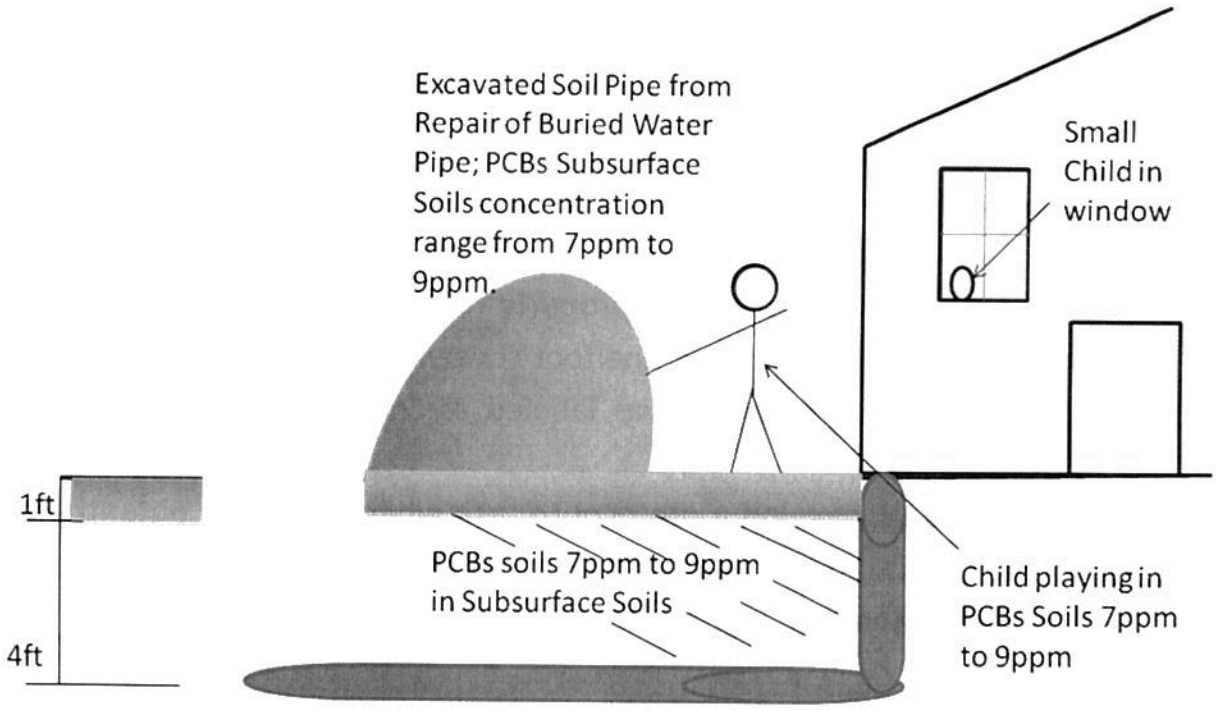


Figure 5: Child playing in Excavated Soil, and tracking into home

3. The homeowner does not fill in the hole for three days. When the hole is finally filled, the soil that has a concentration of 9ppm of PCBs, part of that residual soil has been spread over the surface of the one foot clean soil. Taken into account the width of the excavation soil and the excavated hole, which could be approximately 6 feet wide, the soil for that area now contains above 1ppm of PCBs, which is the trigger level for the NTC Agreement to be remediated. ATSDR concluded at the Baldwinville, Worcester County, Massachusetts Site that the levels of PCBs that would remain in surface soil between 2 ppm and 10 ppm pose a potential public health hazard, (Scogin, 2010).
4. The homeowner was not the owner but a renter who has no knowledge of the remediation that was done on that property. She/he only knows that the repairs to the broken pipe had to be done in order to deter any increases in his/her water bill.
5. Suppose the pipe was repaired in the winter and over the summer grass grew over the repaired area where the pipe was repaired, and a new tenant has moved into the house. It has been demonstrated that the old

owners will not convey to the new owner that there was a concern on the property. In an article posted by the Denver Post on proprieties with meth clean-up, sellers would not convey to the buyers that the properties had been decontaminated for the present of meth, Ghee, 2013.

6. In November P/S sends out the survey letter and performs the drive-by survey. The owner of the property replies back to P/S that there was no action or damage to the one foot cover. Grass has grown over the repaired area and the property was labeled as "no disturbance" to the one foot cover.
7. P/S should develop a protocol to take when there is a potential breach of the cap cell, since P/S point out that Anniston has an aging infrastructure and the Anniston water pipes has burst.

The history of the residential community is that PCB soils were brought into the community to fill in low lying areas, and PCB soil contamination was contained to the top surface of the properties. The EPA publication has determined that PCBs concentration below 1ppm is protective of human health throughout the county (EPA, 2005). The Publication states that < 1ppm of PCB concentration can be found in any urban city. Knowing the history of the PCB Anniston Site and the acceptable limits in an urban environment, why not be **Consistent** throughout the remedial action goal and remediate all residential soil in OU-1/OU-2 to what has been acceptable in an urban environment. This action would:

1. Protect any subsurface digging as it relates to planting a tree, planting a vegetable garden, or adding a structure to an owner's property.
2. Eliminate the one year survey of properties with residual PCBs left in place under the one foot of protective covering,
3. Solve the transit turnover of rentals that are unaware of intrusion into the protective 1 foot covering, and unaware of the P/S letter that was or will be mailed out to absentee homeowners who rent their homes and do not inform the new tenant of the remediation done on the property. The deed restriction applied to transfer of property to another owner, 40 CFR§761.61(a) (8).

4. Property value across this impacted area would be **Consistent** in damages by meeting the acceptable minimal level of < 1ppm of PCBs concentration in soil. This would also mean that although your property has over grown vegetation; less than 1ppm PCBs concentration was detected within the soil and did not trigger a remedial alternative, the value of the property would be **Consistent** with the properties that was remediated; **Consistent** with any urban City properties in the United States, and meets the EPA's Streamlined Risk Evaluation (SRE) of October 2002 to establish the surface soil residential clean-up level for total polychlorinated biphenyls (PCBs) (EPA, 20002b).

TA is advising the community to consider the above scenarios and move towards the EPA Remedial Alternative that requires:

Removal of surface and subsurface soil, from residential properties with PCB concentration ≥1 ppm to a depth of 48 inches below ground surface. The actions for surface soils are consistent with removals previously completed under the NTC Removal Agreement and the Stipulation Agreement. This Alternative includes returning to approximately 97 properties that were previously addressed under the NTC Agreement; removing the previously placed 12–inch layer of clean backfill; excavating deeper to achieve <1ppm to a depth of 48 inches, or to a concentration depth of <1ppm PCBs, and backfilling and restoring the area. This action would also address conducting additional residential removal where applicable, if access is granted, or if overgrown conditions changes. Soil generated during the additional removals may be disposed of in the SSSMA if the PCB concentrations of the composition samples are <10ppm. Figure 6 depicts what the surface soil concentration after a water pipe repair.

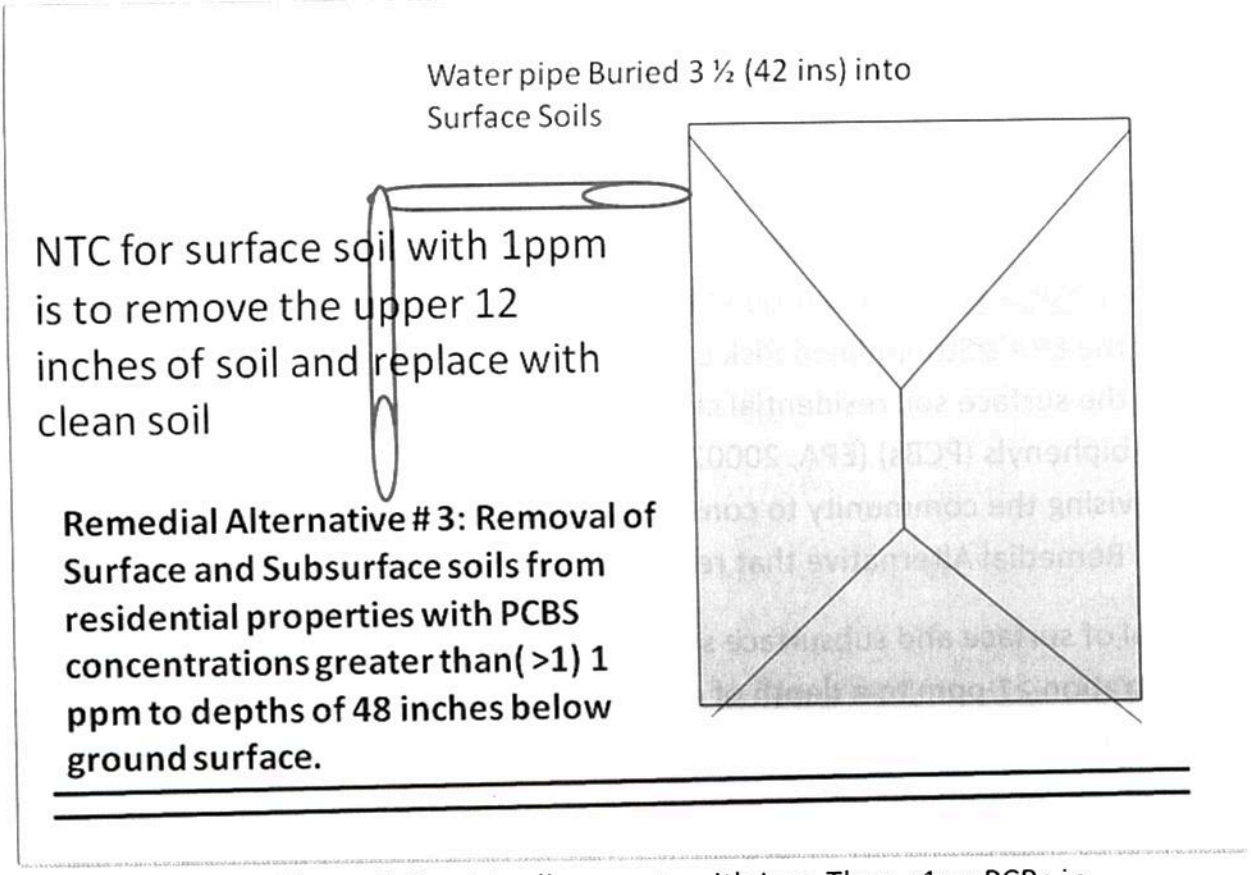


Figure 6: Depicts all property with Less Than <1pp PCBs in Surface and Subsurface Soils.

Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:21 AM
To: Pearce, Jennifer
Subject: FW: Part 2 0f 4
Attachments: Part 2 of 4 Draft Document.doc

From: Scully, Pam
Sent: Monday, June 13, 2016 7:05 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: Part 2 0f 4

From: Bertrand Thomas [mailto:bertrandthomas10@att.net]
Sent: Wednesday, May 11, 2016 11:21 AM
To: Scully, Pam
Subject: Part 2 0f 4

TA review of RA

Special Use Properties Soils

Special Use Properties are properties used as churches, parks, daycare centers, or any properties where the community gathers. Two remedial alternatives also draw from the NTC Agreement which includes: addressing residual soil at depth with PCB concentration between 1ppm and 10ppm, and the low activity portion of the special use area. The active remedial alternative also addresses situations where property changes use low activity to high activity and/or a structure for the special use properties. The two remedial alternatives, with the exception of the no action, presented by the EPA, mirror the NTC Agreement in principle. The alternatives are:

2. Excavation and on-site/ off-site disposal of surface soil with PCB with concentrations ≥ 1ppm in the high activity portion of the special use properties. Excavated material would be disposal of on-site if PCB concentrations < 10ppm and disposal of off-site if PCB concentrations ≥ 10ppm. On-site disposal of soils with PCB concentrations < 10ppm that have been characterized by five-point composite samples is provided for in the Stipulation and Agreement through the NTC Removal Action Agreement. Soil management for subsurface soils in the high activity portions of the special use properties would include interactive outreach with landowners regarding any plans to disturb subsurface soils in areas where removal actions were conducted under the Stipulation and Agreement. If land use on a special use property change from low activity to high activity or if a structure from a high activity area is removed, implement a surface soil removal with on-site disposal where PCB concentrations are ≥ 1ppm. In addition to the removal action included with this alternative, the low activity portion of the special use properties would be evaluated and addressed as part of the broader nonresidential area in OU-1/OU-2.

3. Excavation and on-site/ off-site disposal of surface soil with PCB with concentrations ≥ 1ppm in the high and low activity portions of the special use properties. Excavated material would be disposal of on-site if PCB

concentrations < 10ppm and disposal of off-site if PCB concentrations ≥ 10ppm. On-site disposal of soils with PCB concentrations < 10ppm is provided is provided for in the Stipulation and Agreement through the NTC Removal Action Agreement that was approved for the Site by the USEPA. The technical approach described in the NTC Removal Agreement includes the use of five-point composite soil samples to characterize PCBs for the purposes of removal and disposal. If a structure from a high activity area is removed, implement soil removal to a depth up to 4 feet with on-site disposal where PCB concentrations are ≥ 1ppm.

PCBs are now found widely distributed in our environment. Generally the concentrations in the environment are quite low (meaning that in an urban environment, PCBs concentration of less than 1 (<1) can be detected on any special use property in the country; however, the chemical properties of PCBs causes them to be concentrated up the food chain in less than 1ppm. Looking at the scenarios where a property owner's pipe burst in the middle of the night or the owner who is running a child daycare center or (illegal daycare center), these owner's reactions may be as follows:

1. Cut off the water and dig a trench approximately two (2) wide by five feet deep, below the freeze frost line to repair the pipe. The soil that contained 9ppm is now on top of clean soil, see Figure 4.
2. The next morning it is warm, the children see the pile of excavated soil with a concentration of 9ppm roped off with a sign stating that this is a danger area "keep out". The children will find a way to play on the dirt pile regardless of what measures are taken to restrict access, which means that the Children are now playing on soil containing 9ppm of PCB. The soil is on their clothes, shoes, and hands. The children go into the house and start playing with a younger child and the child either crawl or walks on the floor where the children walked into the house with PCB soil concentration of 9ppm of soil. ATSDR states that children should be discouraged from playing in dirt that contains PCBs, (ATSDR, 2014, Bullet 3), see Figure 5.
3. A day goes by; a part is needed to fix the pipe and has to be order by the contractor. The contractor goes home with PCB soil concentration of 9ppm

and holds his new baby girl; he has to wait two days for the part before repairing the pipe. The children are still playing on the soil with PCBs soil concentration of 9ppm. ATSDR states that workers can transport PCBs Soils on clothes, ATSDR, 2014, Bullet, 4. Figure 7 depicts a worker digging a ditch to repair a busted water pipe.

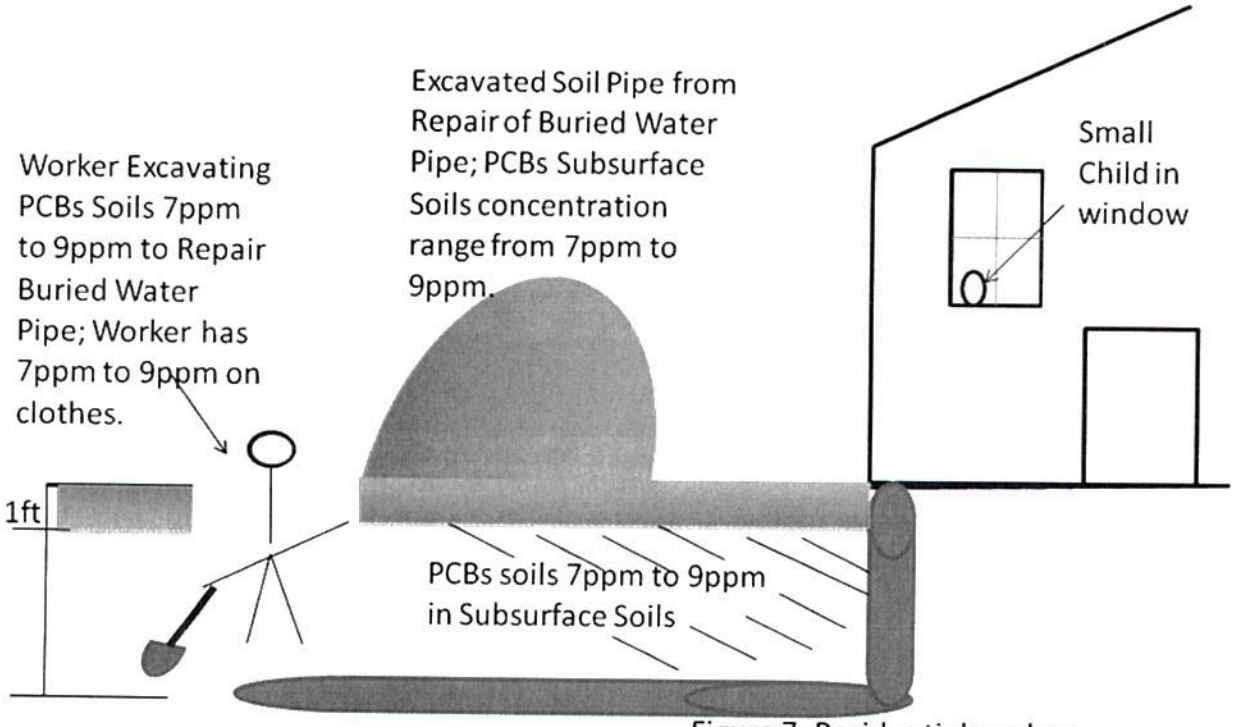


Figure 7: Residential worker Repairing Busted water Pipe

4. The owner was not the owner but a renter, who has no knowledge of the remediation that was done on that property. He only knows that he must repair the broken pipe so that his water bill will not increase.
5. The pipe was repaired in the winter, over the summer, grass has grown over the repaired pipe and a new tenant has moved into the building.

Figure 8 depicts PCBs soils spread on top of Clean soil.

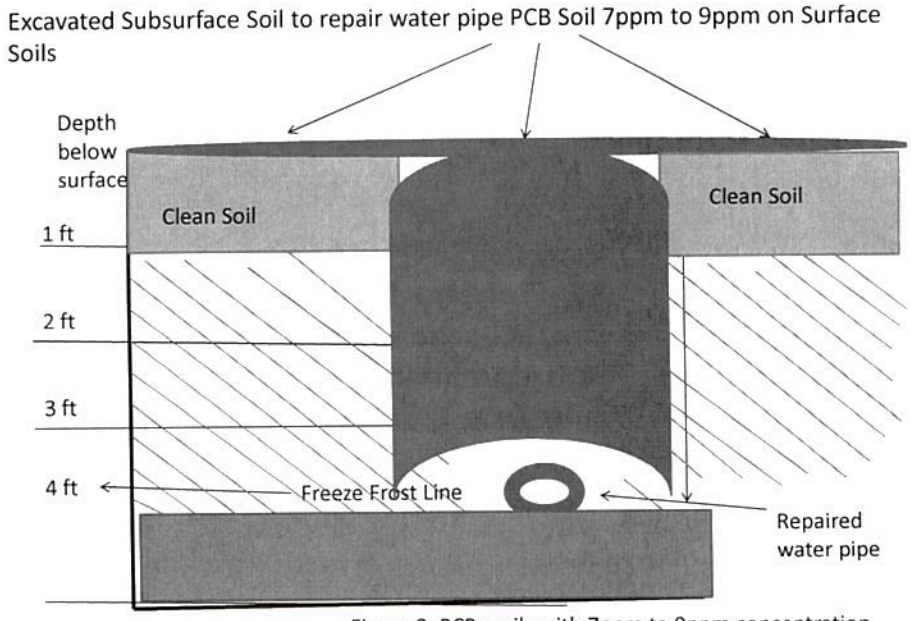


Figure 8: PCBs soils with 7ppm to 9ppm concentration spread on top of Clean Soil.

6. In November P/S sends out the survey letter and performs the drive-by survey. The owner of the property sends the letter back to P/S with no action or damage to the one foot cover. Grass has grown over the repaired area and the property was deemed no disturbance to the one foot cover.

From the Remedial Investigation (RI), it has been accepted that PCBs in Anniston was restricted to the top surface to fill in low areas. By voting for EPA's Remedial Alternative number 3 on Special Use Properties, this vote will bring Anniston properties in line with any urban city in the United States, and will lessen the concerns about a busted water pipe in the middle of winter; lessen the concern about a child or worker coming with more than 1ppm or greater (>1ppm) of PCB on their clothes; and would be **Consistent** with ATSDR and the EPA risk acceptance of less than 1ppm concentration of PCBs on all properties found in a urban environment. Property value would be equal across the City regardless of whether activities on the properties remain the same or change. Figure 9 and 10 depicts Residential Remedial Alternative #3.

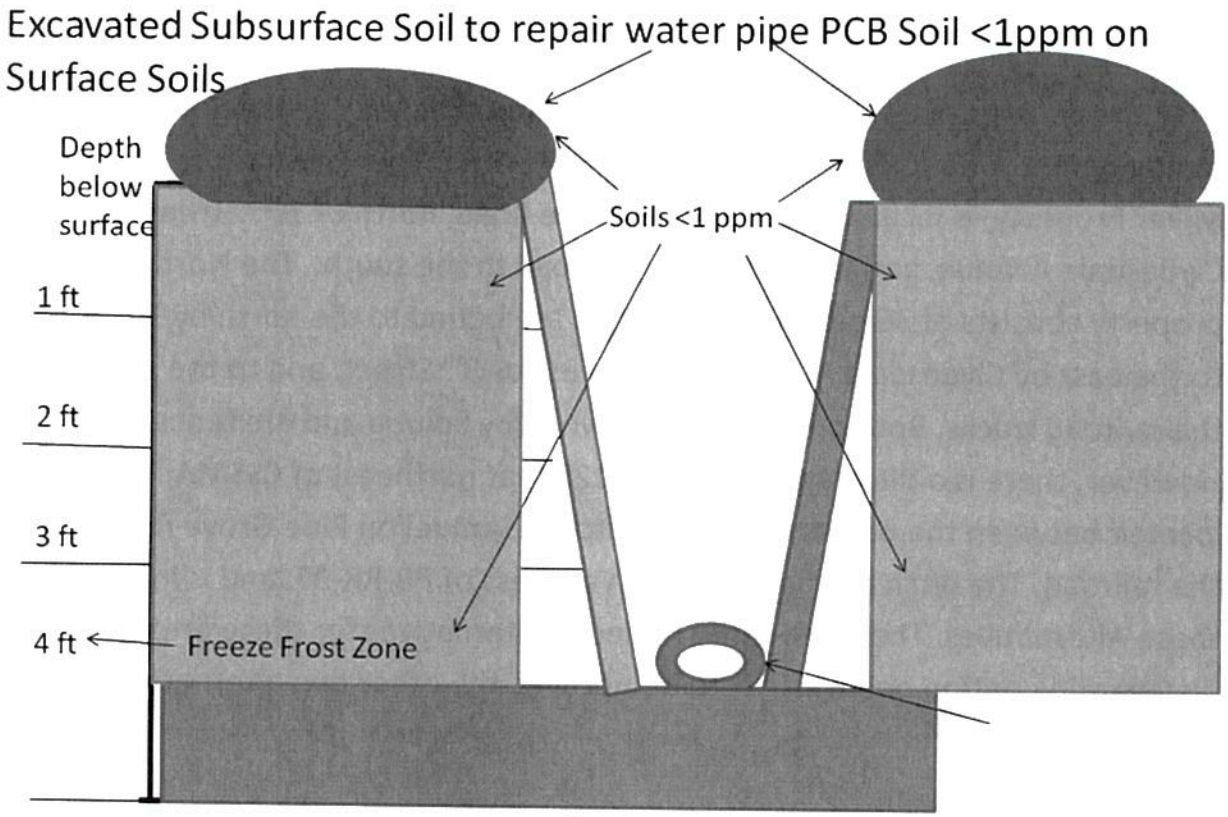


Figure 9: Repairing Busted Water Pipe with Residential Remedial Alternative #3.

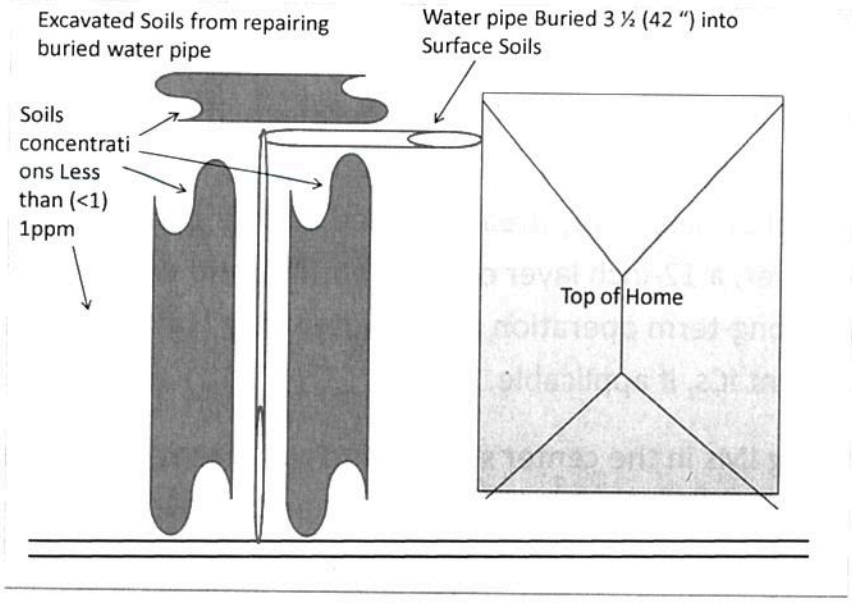


Figure 10: Surface and Subsurface soil Less Than <1ppm PCBs concentrations.

Interim Measures

The Interim Measures Remedial Alternatives includes the Central Soil Staging and Management Area (CSSMA) and the Northside Area. The CSSMA, formerly the Miller Property, is located west of Pine Grove Road, north of 10th Street, east of Clydesdale Avenue, and border by the rail road to the south. The Northside property consists of 36 parcels. The parcels are bound to the north by 10th Street, to the east by Clydesdale Avenue, to the west by 9th Street, and to the south by the railroad tracks. Both properties are owned by Solutia and are fenced. However, there is a ditch approximately 125 feet northeast of CSSMA. The ditch is located between the property of Rev. Mitchell Samuel on Pine Grove Road and the railroad. The ditch has been given an address of PB-RR-37, and is included in these Alternatives. There are three remedial alternatives for these areas, disregarding option one which is to do nothing, the other two alternatives are as follows:

2. Expansion of existing IMs in the center staging and soil management area (CSSMA) (including the drainage ditch to the north and PB-RR-37) and the Northside area to meet the nonresidential PRG for PCBs of 21ppm. This would include placing caps and covers using the original approaches that were used for these IMs. The approach for capping drainage way areas with high PCB concentrations included placing a low permeability liner, covering the liner with a 12 inch layer of clean soil, and planting vegetation to stabilize the area. Nondrainage way areas included a cover system with a geotextile marker layer, a 12-inch layer of clean backfill, and vegetation to stabilize the areas. Long-term operation and maintenance (O&M) for the covers, and implement ICs, if applicable.

3. Expansion of existing IMs in the center staging and soil management area (CSSMA) (including the drainage ditch to the north) and the Northside area to meet the nonresidential PRG for PCBs of 21ppm. This would include placing caps and covers using the original approaches that were used for these IMs. The approach for capping high PCB concentration drainage way areas included placing a low permeability liner, covering the liner with a 12

inch layer of clean soil and planting vegetation to stabilize the area. Nondrainage way areas included a cover system with a geotextile marker layer, a 12-inch layer of clean backfill, and vegetation to stabilize the areas. Excavation and off-site disposal of high concentration soils in the PB-RR-37 area. Long-term O&M for the covers, and implement ICs, if applicable.

Figure 14 depicts locations of Interim Measures and Ditch PB-RR-37

Interim Measures (IM)
The Interim Measures: **IM**-Remedial Alternatives includes the Central Soil Staging and Management Area (CSSMA) and the Northside Area. The CSSMA, formerly the Miller Property, is located west of Pine Grove Road, north of 10th Street, east of Clydesdale Avenue, and borders the rail road to the south. The Northside property consists of 36 parcels. The parcels are bound to the north by 10th Street, to the east by Clydesdale Avenue, to the west by 9th Street, and to the south by the railroad tracks. Both properties are owned by Solutia and are fenced.

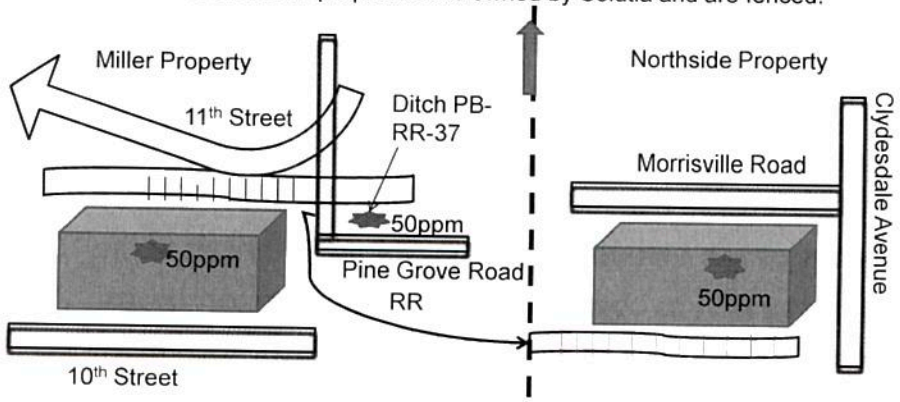


Figure 14

Figure 15 depicts EPA Remedial Alternative #2

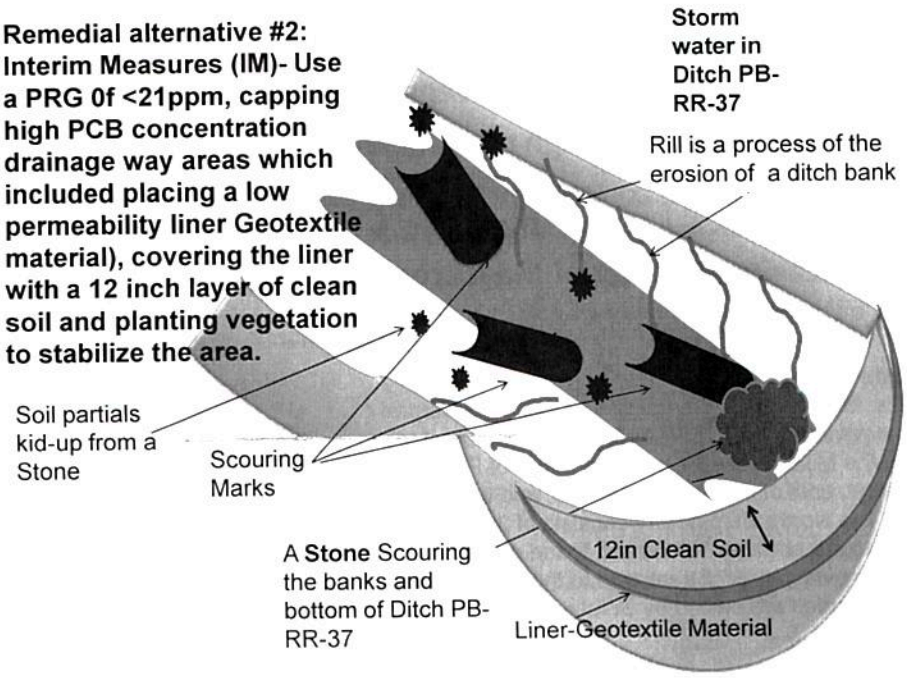


Figure 15

The CSSMA and the Northside area are properties under the control of Solutia management. The EPA evaluated the risk for nonresidential PRG for PCBs at 21ppm. Because the properties are owned by Solutia Management, it is the responsibility of Solutia and the EPA to contain the contamination on those properties through long-time operation and maintenance (O&M). Also high concentration of PCBs should be removed because the CSSMA was supposed to be for soil concentration ≤ 10ppm. Soil concentrations greater than 10ppm should be excavated and replaced with clean soil. To stabilize conditions on these properties, a cover system with a geotextile marker layer, a 12-inch layer of clean backfill, and vegetation to stabilize the areas. The EPA's alternative as it relates to the ditch located northeast of the CSSMA, is to cap the high PCB concentration drainage way area by placing a low permeability liner and covering the liner with a 12 inch layer of clean soil and plant vegetation to stabilize the area.

TA: For the two properties CSSMA, The EPA should require the same cap that will be designed for the South Staging Soil Management Area (SSSMA) to be used for the CSSMA since both location stores PCBs concentrated soils ≤10 ppm, (Golder Associates, 2006). Also, access control should always be maintained with proper O&M as proposed in the SSSMA document. The ditch, identified as PB-RR-37,

located northeast of CSSMA should be remediated to soil concentration ≤ 10ppm. The reason is that erosion is greater in ditches, from the rill of the banks and scouring along the ditch bottom. The erosion activities would erode the 12 inch cover of soil and stones could puncture the load permeability liner. The EPA alternative also calls for an O&M plan to maintain the integrity of the cover; however, there is already a problem with O&M with the City ditches. The more favorable remediation alternative approach is to excavate and be **Consistent** with the national acceptance of less than 1ppm concentration of PCBs on all properties found in an urban environment. Figure 16 depicts EPA Remedial Alternative #3 with TA alternative.

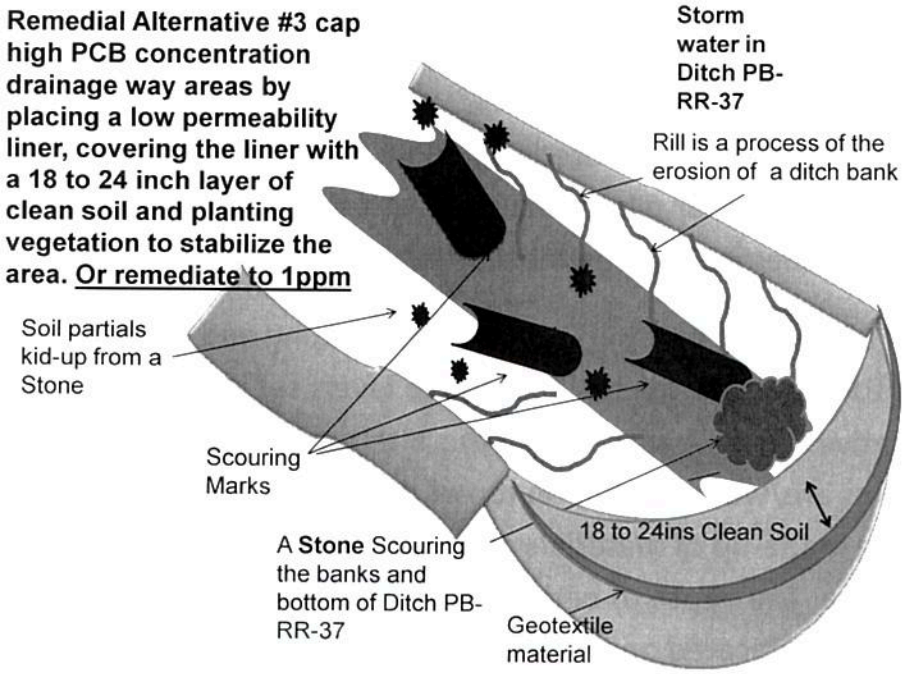


Figure 15

Dredge Spoil Piles

There are four (4) Dredge Spoil Piles located outside the banks of Snow Creek and residual Dredge Spoil Piles that has been removed. Only one remaining Dredge Spoil Pile exceeds the PRG of 21 ppm of PCBs concentration soils; however the piles that are still in place in those locations that were removed has to be addressed. Disregarding the no action, The EPA proposes three remedial alternatives, they are as follows:

2. Excavation and off-site disposal of dredge spoil pile SC-8. All of the excavated materials are anticipated to have PCB concentration <50 ppm and would be disposed of in an off-site nonhazardous waste landfill. The area beneath the dredge spoil pile SC-8 would be addressed as part of the nonresidential portion of the floodplain.

3. Excavation and off-site disposal of dredge spoil pile SC-8. Materials with PCB concentration <50 ppm and would be disposed of off-site and material with concentrations ≥50 ppm would be disposed of off-site. Based on the Characterization data for the dredge spoil pile SC-8, little to none of the material from dredge spoil pile SC-8 will require off-site disposal. The area beneath dredge spoil pile SC-8 would be addressed as part of the nonresidential portion of the floodplain.

The Dredge Spoil Piles are the results of dredging Snow Creek, most of the piles have been removed. There are four piles remaining with one SC-8 above the PRG 21ppm. Option number 3 seems to be the most stringent option.

TA: The EPA remedial alternative number 3 calls for Excavating and removal of the dredge spoil pile and to remediate the residual soil to levels set in the nonresidential alternatives. The TA agrees with this alternative after evaluating the soils where the piles are/were located on top of the floodplains. The floodplain soil beds are made-up of materials composed of sandy clays, gravel, and bedrock contact area. The depth to bedrock is approximately two to four feet. These dredge piles are located on the 100 year floodplain which will be addressed in the nonresidential section. One of the alternatives is to lower the PRG to 9ppm. The TA will address nonresidential soils in the nonresidential section of this report.

Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:23 AM
To: Pearce, Jennifer
Subject: FW: CAG Corrected Suggestions for PEER Review Committee
Attachments: PEER Committee 2016 Anniston PCB Site Community Advisory Group corrected.docx

From: Scully, Pam
Sent: Monday, June 13, 2016 7:06 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: CAG Corrected Suggestions for PEER Review Committee

From: Community Advisory Group [mailto:cag_cd@annistoncag.org]
Sent: Wednesday, May 11, 2016 9:43 AM
To: Legare, Amy; Scully, Pam
Subject: CAG Corrected Suggestions for PEER Review Committee

Good morning,

Sorry for the inconvenience, I failed to correct the suggestions. A corrected copy is attached.

Thanks, Cindy

--

Cynthia Calix

Administrator
Community Advisory Group For The Consent Decree
1812 Wilmer Avenue

Suite B
Anniston, AL 36201
*Voice: 256*741*1429*
*FAX: 256*741*3224*
Website: www.annistoncag.org

Community Advisory Group (CAG) is an advisory group of citizens who exists to serve as a place for the exchange of information and input from the community in the affected area and advise those individuals and organizations charged with carrying out the actions described in the Consent Decree in an effective and well-managed manner.

Anniston PCB Site Community Advisory Group

Comments of Alternatives for Operable Units 1 & 2 for the PEER Review Committee

1. Remedial Alternatives for Residential Soil
    a. Complete NTC, remove more PCB's and manage residuals.
2. Remedial Alternatives for Special Use Properties
    a. Remove more PCB's from high and low activity areas and manage residuals.
3. Remedial Alternatives for Interim Measures
    a. Excavate around existing interim measures to meet non-residential goals, excavate any PTW found within interim measures.
4. Remedial Alternatives for Dredge Spoil Piles
    a. Remove all dredge piles and dispose offsite.
5. Remedial Alternatives for Unapproved Waste Disposal Areas
    a. RCRA subtitle D, CAP all three locations.
6. Remedial Alternatives for Non=Residential Soil
    a. Excavation, offsite disposal and management of residuals.
7. Remedial Alternatives for groundwater at T-11
    a. Excavate high concentrations and surface soil, offsite disposal, low permeability cap, pump and treat groundwater and monitor.
8. Remedial Alternatives for Sediment
    a. Excavate and offsite disposal.
9. The Air remains a health concern for the community, although we have been told it should not be. The community would like to have air monitoring with each five-year review of the remedy. We would like results of the air monitoring during all construction activities.
10. After the Creek is clean, the community would like to have 50% of residential property adjacent to the Creek resampled, to insure that they are still protected.

Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:23 AM
To: Pearce, Jennifer
Subject: FW: FS Alternatives

From: Scully, Pam
Sent: Monday, June 13, 2016 7:11 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: FS Alternatives

I forwarded this email to NRRB for ADEMs comment.

From: Duites, Metz [mailto:MPD@adem.state.al.us]
Sent: Thursday, April 21, 2016 11:07 AM
To: Scully, Pam
Subject: RE: FS Alternatives

That's fine.

Thank you!

-Metz-

From: Scully, Pam [mailto:scully.pam@epa.gov]
Sent: Thursday, April 21, 2016 10:06 AM
To: Duites, Metz
Subject: FW: FS Alternatives

Metz,
This is the email I have from you. If you don't want to send anything additional for the remedy review board to consider, I will give them this information, OK?
Pam

From: Duites, Metz [mailto:MPD@adem.state.al.us]
Sent: Thursday, January 14, 2016 12:15 PM
To: Scully, Pam
Cc: Pierce, Austin R; bespy@adem.state.al.us
Subject: RE: FS Alternatives

Hello Pam,

I called your office and left a message and then called your mobile phone. I'm realizing that you could be on your lunch break. Regarding your inquiry; ADEM agrees with your recommendation of requiring additional excavation and removal of contaminated soil that would eliminate the need for perpetual monitoring.

Thank you,

-Metz-

From: Scully, Pam [mailto:scully.pam@epa.gov]
Sent: Tuesday, January 12, 2016 6:32 AM
To: Duites, Metz; Pierce, Austin R
Subject: FS Alternatives

Metz and Austin,
I was wondering how ADEM feels about the Auto Fluff disposal areas we found during the RI/FS for OU1/OU2 of the Anniston PCB Site. The Anniston Lead site cleaned up a similar site on Carter Street by excavating the waste. Solutia doesn't want to include total excavation. I am just curious where ADEM will come out on this. I would love to know if ADEM agrees with the all the alternatives EPA has asked them to evaluate, or if there is something else that should be included.
Pam

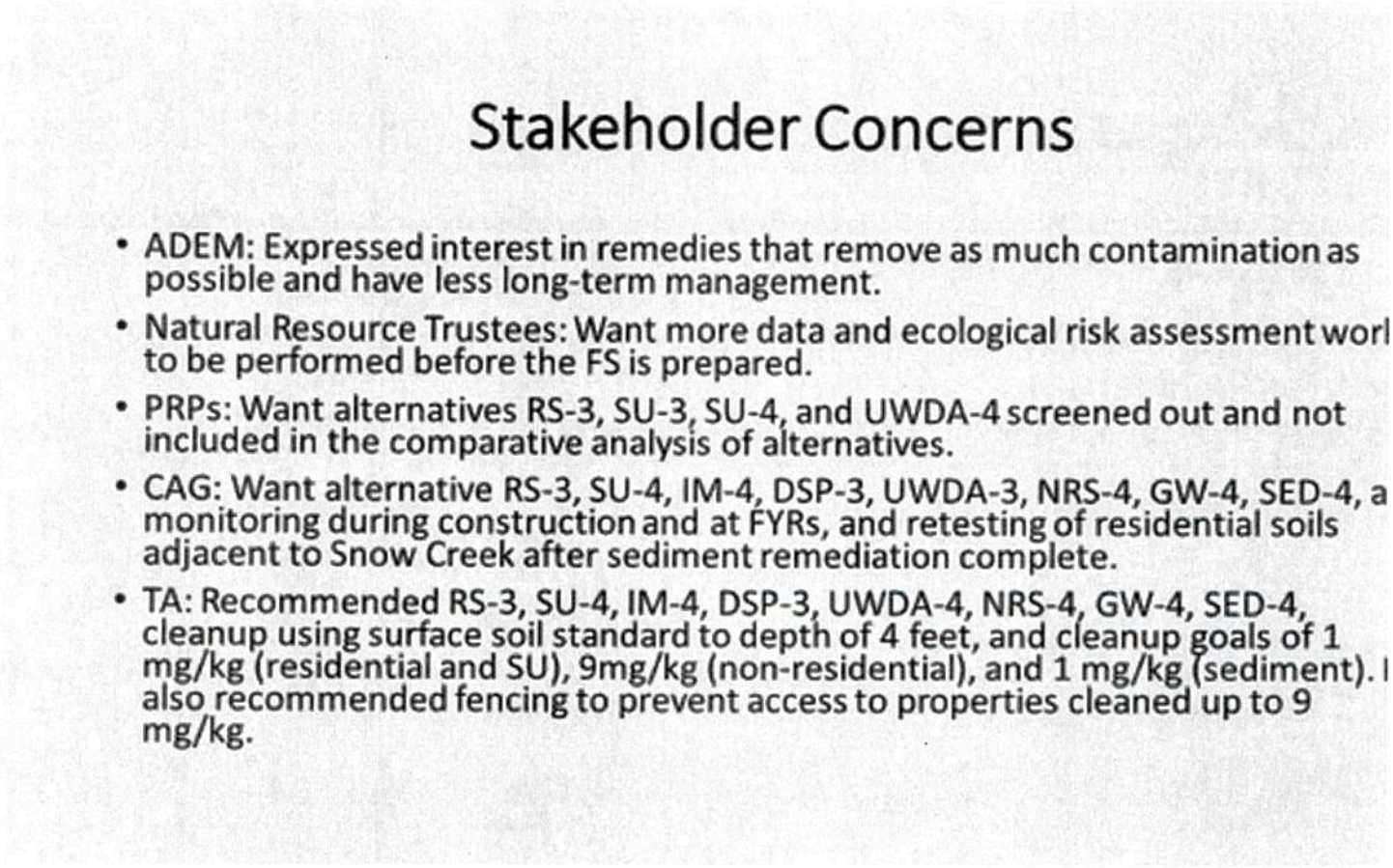
Pamela J Langston Scully, PE
Remedial Project Manager
US Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Telephone: (404)562-8935
Mobile phone: (404)661-7378

Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:23 AM
To: Pearce, Jennifer
Subject: FW: Summary of Stakeholder comments to NRRB

From: Scully, Pam
Sent: Monday, June 13, 2016 7:13 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: Summary of Stakeholder comments to NRRB



Pamela J Langston Scully, PE
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Atlanta, GA 30303

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Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:23 AM
To: Pearce, Jennifer
Subject: FW: 4 of 4 TA comments on RA
Attachments: Part 4 of 4 Remedial Document.doc

From: Scully, Pam
Sent: Thursday, June 16, 2016 1:52 PM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: 4 of 4 TA comments on RA

From: Bertrand Thomas [mailto:bertrandthomas10@att.net]
Sent: Wednesday, May 11, 2016 11:29 AM
To: Scully, Pam
Subject: 4 of 4 TA comments on RA

TSCA regulation states that PCBs must be disposed of two ways, either by incineration or in a chemical landfill. The TA recommends that the community look at nonresidential properties using Remedial Alternative number 4 (excavation, off-site disposal, and soil management), and also look at children playing on these properties or digging for worms to fish. Disregarding option number 1, the TA's reason for this approach is as follows:

- There are industrial nonresidential properties adjoining residential properties. For these cases, the TA recommend that these properties have a PRG of <9ppm. Access to these properties is not restricted.
- Nonresidential properties that are opened to the public, the public can walk on to the property and therefore the properties should have a fence around them.
- Scouring would not be a threat during flooding, which could release high concentration of PCBs in sediment soils.
- By excavating to <9ppm or <1ppm of PCB concentration in soils will remove the stigma that EPA left high concentration of PCBs in Snow Creek to migrate downstream.
- After removal of the contaminated PCB soils, the properties downstream should be re-evaluated.
- Depth to bedrock along Snow Creek is approximately 3 to 4 feet in most locations and in some location it may be less than a foot to bedrock.
- Monitoring of the ecosystem should also be done to evaluate any changes along with flooding of the areas.
- Burning can eliminate the present of PCBs in soil but will cause air pollution.

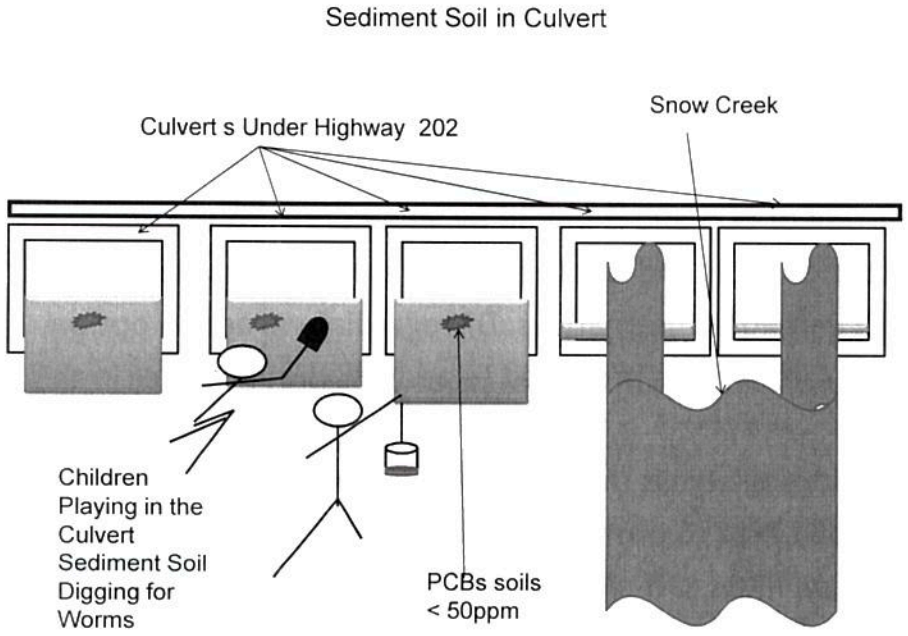
The removal will have adverse affects but the threat of releasing high PCBs soils downstream through leaching will be reduced and there will be a reduction in PCB intake through the food chain as well as removing the threat of children playing in the sediment soils.

Sediment and Creek Bank Alternatives

The RI for OU-1/OU-2 identified that sediment in Snow Creek was a problem where culverts are located. The EPA's detailed analysis of Remedial Alternatives for sediment and creek bank areas was based on a PCB PRG of 3ppm. The EPA also evaluated PCB PRG of 1ppm and 10ppm, which was considered in terms of area/volume and cost sensitivity. Also, two locations of sediment deposits in Snow Creek have concentrations of metal above the respective PRGs and do not exceed the 3ppm PRG for PCBs. The EPA proposed three (3) remedial alternatives, excluding the no action alternative. The three remedial alternatives are as follows:

2. Removal of sediment obstructing culvert and excavation of sediment from the OU-1/OU-2 portion of Snow Creek with PCB concentration above PRGs with off-site disposal for all excavated materials. Stabilize creek banks that are unstable or may become unstable during or following excavation of creek sediment and that have soil concentration above sediment PRGs.
3. Removal of sediment obstructing culvert and excavation of sediment from the OU-1/OU-2 portion of Snow Creek with PCB concentration above PRGs. Off-site disposal of materials with PCB concentration ≥50ppm in the SSSMA.. Stabilize creek banks that are unstable or may become unstable during or following excavation of creek sediment and that have soil concentration above sediment PRGs.
4. Removal of sediment obstructing culvert and excavation of sediment from the OU-1/OU-2 portion of Snow Creek with PCB concentration ≥10ppm and MNR for the remainder of the sediment. Off-site disposal of materials with PCB concentration ≥50ppm with onsite disposal of excavated sediment with PCB concentration <50 in the SSSMA. MNR would be applied to sediment deposits that have average PCB concentration < 10ppm. Stabilize creek banks that are unstable or may become unstable during or following excavation of creek sediment and that have soil concentration above sediment PRGs.

The EPA and P/S (in the RI) has stated that high concentrations of PCBs are present in and around culverts. The community has complained of children playing in the ditches where these culverts are located. Figure 12 depicts a scenario with children playing in the ditch under Highway 202. This scenario was expressed by residents who live behind the creek and Mr. Baker of the CAG.



The TA recommends option number 4, but add that the sediment in and around these culverts be remediated to a PRG of <1ppm. The reasons are as follows:

- Children are playing in these sediment soils, and transporting the contaminated soils into their apartments or homes.
- There are no fences to discourage these children from climbing down into the ditches; however, children are still playing in the ditches where high concentrations of PCB exist. A fence would deter access to the children. In the Hudson River ROD fences are recommended to deter access to the public (EPA Hudson River, 1989).
- The threat of flooding may be reduced by the removal of sediment from within these culverts.

- While performing remediation on a short-term basis, there is the threat of suspended sediment migrating downstream; however the long-term threat would be removed by excavating these soils.
- Communication between the City of Anniston, EPA, Solutia, and the Community should come together to solve a problem that threatens their neighborhood.

Groundwater at T-11

T-11 is a monitoring well that contains PCB contamination and the area is located in the most eastern portion of EU5 and is bound by Snow Creek to the west and south, railroad tracks to the north, and located behind a church property. The EPA has proposed the fourth Remedial Alternatives. Disregarding no action option, there are three Remedial Alternatives proposed to address groundwater in this area. They are as follows:

2. Excavate 12 inches of soil across the broader T-11 area and the deeper soils immediately surround T-11 to protect groundwater and meet the floodplain surface soil PRGs. Off-site disposal of the excavated soils, groundwater monitoring, and O&M of the cover soil. Implement groundwater use restrictions through ICs.
3. Excavate 18 inches of soil across the broader T-11 area and high concentration soils immediately surrounding well T-11 to protect groundwater, meet the surface soil PRGs and maintain the hydraulic profile of surface soil. Excavated soils would be disposed of off-site. Install a low permeability cap to limit infiltration and monitor groundwater concentrations. Long-term O&M will be necessary for the cap. Implement groundwater use restrictions through ICs, if needed. Implement ICs for groundwater, and for the cap, if required.
4. Excavate 18 inches of soil across the broader T-11 area and high concentration soils immediately surrounding well T-11 to protect groundwater, meet the surface soil PRGs and maintain the hydraulic profile of surface soil. Excavated soils would be disposed of off-site. Install a low

permeability cap to limit infiltration. Install, operate, and maintain a groundwater extraction and treatment system with discharge of treated water to Snow Creek. O&M for the low-permeability cap and the groundwater pump-and-treat system will be necessary. Implement groundwater use restrictions through ICs, if needed. Implement ICs for groundwater, and for the cap, if required.

The TA would like to know where the contamination is originating from and recommends that the PRG soil in this area be excavated to a PRG <1ppm. The RI is supposed to define the nature and extent of contamination in soil and water. If the extent of contamination cannot be determined, the TA believes that the most stringent alternative should be applied to this property and evaluated as residential even if the property is not. The TA recommends option number 4. But the excavation of this area should be to a PRG value of <1ppm.

ICs for Green Remediation Strategy

The Remedial Alternatives did not have a section on Green remediation strategy. The TA explored options that may be employed through the ICs process. Many of these strategic actions can be addressed through policy and guidance development, resource development, and a series of near-term initiatives:

- Maximize use of renewable energy with a goal of 100 percent renewable energy to power site operation and identify methods for increasing energy efficiency.
- Incorporate green remediation factors as part of remedy optimization evaluations.
- Pursue ways to reduce the use of natural resources and energy during remedial action and when developing cleanup alternative.
- Integrate clean, renewable and innovative sources and advanced diesel technologies.

- Help communities establish networks and training programs that enable local workers to gain proficiency in expertise needed for green cleanup.

The TA reviewed section of superfund and would add the following ICs:

1. Since a cap will be placed over the CSSMA and the Northside Area, why not construct a solar farm on the properties? A portion of the proceeds from the savings could be used to power the plant and for community projects in the City of Anniston.
2. Set-up environmental educational programs in local schools. A multi-disciplinary approach to learning about environmental issues that enhances knowledge, builds critical thinking skills and helps student make informed and responsible decisions.
3. With all the vacant land, a park could be designed around neighborhoods with trees and could be used for teaching nature classes.

Redevelopment:

TA: Everyone wants redevelopment; however, redevelopment comes with an attraction for developers. There are two attractions that could fit into this area - one is to create a partnership with P/S and construct a world class softball or little league Baseball field that could host the regional championship. An example is the former Spellman Engineering site in Orlando, Florida, which now hosts a local school's sports and recreation complex. Some jobs would be seasonal but large sums of tourist dollars would boost the economy.

Redevelopment could bring in more industry. What is the attraction for a business to move to Anniston? Anniston is a central location between four metropolitan areas: Atlanta, Montgomery, Birmingham, and Chattanooga. Anniston, as a business center, started out as a tourist resort for the surrounding cities. During the industrial years, Anniston flourished and was the central distribution point for the southeast; however, that era has past. The City is looking for a new identity, and does not want another chemical company, but the residents must be able to co-exist with old businesses and new businesses that may moves to Anniston. The City plans to redevelop Carver Homes and some members in the community do

not want to move or do not have the finances to move. Attracting businesses will be a difficult task, since most of the people moved to Anniston during the industrial era. Today's work force has changed and so must the minds of the community. There are still reliable businesses in Anniston, however, to attract new businesses, the City has its work cut out, but so did the people in Bunker Hill. The Bunker Hill community established a first class automotive dealership, and a resort. The City of Anniston can return to what the founder's originally established the City for, which is a tourist destination or draw from the automotives industry which is already located within the Anniston area.

References:

1. USEPA, 2007, Pilot Survey of Levels of PCDD, PCDF, PCB, and Mercury in Rural Soil of the US Washington DC, Conclusion.
2. ATSDR, August 27, 2014, Toxic Substance Portal-Polychlorinated Biphenyls (PCBs), Public Health Statement Toxicological Profile, How Can Families Reduce the Risk of Exposure to PCBs, Bullet 3.
3. Scogin, Gail E, April, 29, 2010, ATSDR, Public Health Assessment and Health Consultations, Temple-Stuart, Massachusetts Report, Baldwinville, Worcester, County, Conclusion.
4. ATSDR, August 27, 2014, Toxic Substance Portal-Polychlorinated Biphenyls (PCBs), Public Health Statement Toxicological Profile, How Can Families Reduce the Risk of Exposure to PCBs, Bullet 4.
5. Ghee, Tom, March 3, 2013, Meth contaminated homes, its buyer Beware, Denver Post.

Pearce, Jennifer

From: Tanasijevich, Rudy
Sent: Wednesday, July 20, 2016 11:23 AM
To: Pearce, Jennifer
Subject: FW: 3 of 4 TA comments on RA
Attachments: Part 3 of 4 Draft Document.doc

From: Scully, Pam
Sent: Monday, June 13, 2016 7:06 AM
To: Tanasijevich, Rudy <Tanasijevich.Rudy@epa.gov>
Subject: FW: 3 of 4 TA comments on RA

From: Bertrand Thomas [mailto:bertrandthomas10@att.net]
Sent: Wednesday, May 11, 2016 11:27 AM
To: Scully, Pam
Subject: 3 of 4 TA comments on RA

Unapproved Waste Management Areas (UWMA)

UWMA were properties used as scrap car parts (junkyard). There are three (3) UWMA located in the target area. The EPA Remedial Alternatives were to treat these properties as UWMA. Disregarding option one which is to do nothing, the EPA proposed three (3) remedial alternatives; the three remedial alternatives are as follows:

2. Placement of a geotextile fabric over the area(s) followed by the placement of 12 inch-thick cover layer of clean soil as described in the Stipulation and Agreement. This alternative also includes long-term O&M. ICs be necessary for the cap.

3. Placement of a low permeability cap to cover the unapproved waste management areas (UWMAS) to prevent direct contact and minimize potential impacts to groundwater. This alternative also includes groundwater monitoring and long-term O&M to be effective. ICs may be necessary for the cap.

4. Excavation and off-site disposal of all waste. Minimal restoration involving grading for erosion control and hydroseeding to protect slopes. No O&M or ICs are required as all of the UWMAS would be removed under this alternative.

Although these properties were classified as UWMAS, these properties are still in a residential community and should be treated as residential properties. Figure 11 depicts UWMAS, and Figure 12 depicts EPA Alternatives #2 and #3.

Unapproved Waste Management Areas (UWMA)
UWMA were properties used as scrap car parts (junkyard).

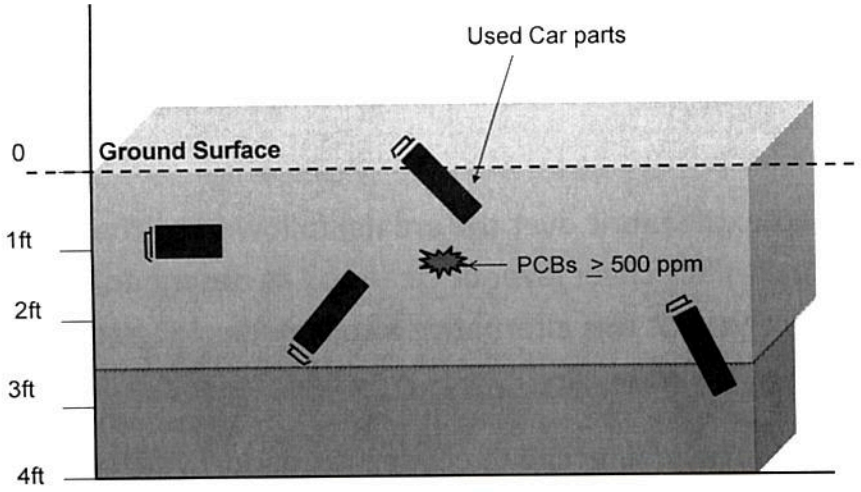


Figure 11

UWMA: Remedial Alternative #2 cover with Cap; #3 add Monitoring well.

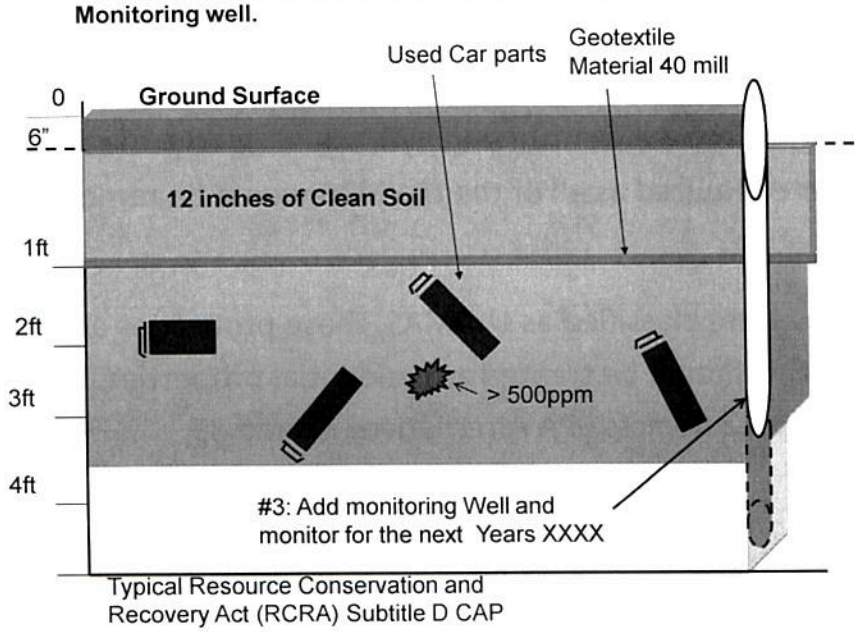


Figure 12

Figure 13 depicts Remedial Alternative #4.

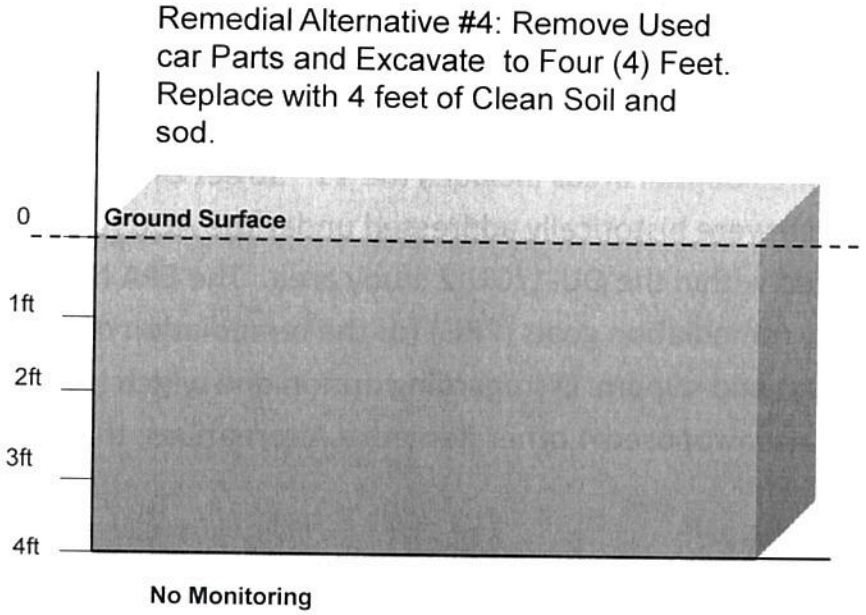


Figure 13

TA: Reviewing the remedial alternative of the UWMAS, the TA would advise the community to choose the fourth alternative for the following reasons:

1. By selecting the remedial alternative number (4), all of the waste will be disposed, there will be no threat to groundwater, and the need for long-term O&M will be eliminated.

2. If the soil concentration is below <1ppm of PCBs in the soil, the property value will be in line with all of the properties in the area.

3. Just for the elimination of long-term O&M and the possibility that if a builder wanted to build something on the properties, there would be no need for Solutia to return and remediate the properties.

Nonresidential Soils

Nonresidential soils are soils contamination from the release of waste product from the plant into Snow Creek and settled out along the 100 year floodplain of Snow Creek. There are two areas outside of the floodplain; one just southwest of the Facility and located next to a former landfill operation and a second just south of Highway 78. Other nonresidential areas includes the 11th Street Ditch, West 9th Street Creek, both of which were historically addressed under the AOC (USEPA 2001a) and are also located within the OU-1/OU-2 study area. The EPA has proposed two preliminary remediation goals (PRG) for the remediation of PCBs in nonresidential soils: 21ppm and <9ppm. Disregarding option one which is to do nothing and the EPA has also proposed 4 other Remedial Alternatives, they are as follows:

2. Nonintrusive approach of covering the existing ground surface with a geotextile marker layer and a 12-inch soil layer to reduce exposure to surface soils. This alterative would be implemented in specific portions of exposure units (EUs) to achieve EU-wide EPCs below the nonresidential surface soil PRG of 21ppm. The resulting target remedial areas are located in EU5, EU7, EU14N, EU19N, EU19S, and EU26. The cover would only be placed in EUs where the addition or 12 inches of soil to the existing ground surface elevations will not increase local flooding EU7, EU19N and EU26. For the target remedial areas that cannot be covered in EU5, EU14N, and EU19S, excavation with on-site/off-site disposal of surface soil would be implemented to achieve EU-wide EPC below 21ppm. Excavated soils with PCB concentration <50ppm would be disposed of on-site in the south staging and soil management area (SSSMA) and soils with PCB concentrations >50ppm would be disposal of in appropriately permitted off-site landfill. These two areas are located adjacent to Highway 202 (near the OU-3, the Plant, and boundary). This remedial alternative would also address the one constituent polycyclic aromatic hydrocarbon (PAHs), relates to burning of fossil fuels or carbon products and are cacogenic), where the EPC value for the OU as a whole exceeds the respective PRG. Soil management would be

conducted as part of the remedy. The soil management activities would limit future intrusive activities on the nonresidential properties from adversely impacting the effectiveness of the nonresidential surface soil remedy and the remedy implements, area utility companies, and county/state-wide transportation agencies regarding any plan to disturb soils in nonresidential areas where construction activities could impact the nonresidential or adjacent residential remedies. Utility organizations that would typically be contacted as a part of the outreach process include sewer, water, gas, electric, oil, cable/fiber optic, etc. Periodic observations of the nonresidential areas would be conducted to confirm that land use continues to be nonresidential.

3. Excavated surface soil to achieve an EU-wide EPCs below the nonresidential surface soil PRG of 21ppm, dispose of soil off-site, backfill the excavated areas with clean soil, and management. . The resulting target remedial areas are located in EU5, EU7, EU14N, EU19N, EU19S, and EU26. Excavated soils would be disposed of in an appropriately permitted off-site landfill. Surface soils in the two areas adjoining the interior of the overall EU footprint with PCB EPC value >21ppm would also be addressed under this alternative. These two areas are located adjacent to Highway 202 (near the OU-3, the Plant, and boundary). This remedial alternative would also address the one constituent polycyclic aromatic hydrocarbon (PAHs), relates to burning of fossil fuels or carbon products and are cacogenic), where the EPC value for the OU as a whole exceeds the respective PRG. Soil management would be conducted as part of the remedy. The soil management activities would limit future intrusive activities on the nonresidential properties from adversely impacting the effectiveness of the nonresidential surface soil remedy and the remedy implemented for nearby residential properties. Special soil management activities would include active outreach with property owner, local city building department, area utility companies, and

county/state-wide transportation agencies regarding any plan to disturb soils in nonresidential areas where construction activities could impact the nonresidential or adjacent residential remedies. Utility organizations that would typically be contacted as a part of the outreach process include sewer, water, gas, electric, oil, cable/fiber optic, etc. Periodic observations of the nonresidential areas would be conducted to confirm that land use continues to be nonresidential.

4. Excavated surface soil to achieve an EU-wide EPCs below the nonresidential surface soil PRG of 21ppm, dispose of soil off-site, backfill the excavated areas with clean soil, and management. . The resulting target remedial areas are located in EU5, EU7, EU14N, EU19N, EU19S, and EU26. Excavated soils with PCB concentration <50ppm would be disposed of on-site in the south staging and soil management area (SSSMA) and soils with PCB concentrations >50ppm would be disposal of in appropriately permitted off-site landfill. Surface soils in the two areas adjoining the interior of the overall EU footprint with PCB EPC values ≥21ppm would also be addresses under this alternative. These two areas are located adjacent to Highway 202 (near the OU-3, the Plant, and boundary). This remedial alternative would also address the one constituent polycyclic aromatic hydrocarbon (PAHs) where the Epc value for the OU as a whole exceeds the PRG. Soil management would be conducted as part of the remedy. The soil management activities would limit future intrusive activities on the nonresidential properties from adversely impacting the effectiveness of the nonresidential surface soil remedy and the remedy implemented for nearby residential properties. Special soil management activities would include active outreach with property owner, local city building department, area utility companies, and county/state-wide transportation agencies regarding any plan to disturb soils in nonresidential areas where construction activities could impact the

nonresidential or adjacent residential remedies. Utility organizations that would typically be contacted as a part of the outreach process include sewer, water, gas, electric, oil, cable/fiber optic, etc. Periodic observations of the nonresidential areas would be conducted to confirm that land use continues to be nonresidential.

5. Excavated surface soil to achieve an EU-wide EPCs below the nonresidential surface soil PRG of 21ppm, off-site treatment for the excavated soil with incineration to destroy the PCB, backfill the excavated areas with clean soil, and management. . Surface soils in the two areas adjoining the interior of the overall EU footprint with PCB EPC value >21ppm would also be addressed under this alternative. These two areas are located adjacent to Highway 202 (near the OU-3, the Plant, and boundary). This remedial alternative would also address the one constituent polycyclic aromatic hydrocarbon (PAHs), relates to burning of fossil fuels or carbon products and are cacogenic, where the EPC value for the OU as a whole exceeds the respective PRG. Soil management would be conducted as part of the remedy. The soil management activities would limit future intrusive activities on the nonresidential properties from adversely impacting the effectiveness of the nonresidential surface soil remedy and the remedy implemented for nearby residential properties. Special soil management activities would include active outreach with property owner, local city building department, area utility companies, and county/state-wide transportation agencies regarding any plan to disturb soils in nonresidential areas where construction activities could impact the nonresidential or adjacent residential remedies. Utility organizations that would typically be contacted as a part of the outreach process include sewer, water, gas, electric, oil, cable/fiber optic, etc. Periodic observations of the nonresidential areas would be conducted to confirm that land use continues to be nonresidential.

The EPA is debating whether to lower the PCB PRG value from 21ppm to 9ppm. This evaluation would affect the volume of material to be excavated and be cost sensitive

TA: The TA conducted a review of the EPA guidance Document on PCB and reviewed the Record of Decision for the Hudson River PCB Site. The nonresidential Remedial Alternatives for the Anniston PCB Site is located within the Snow Creek 100 year Floodplain, with the exception of two areas. To add to the complication of the remediation of the nonresidential alternatives, there is one area where the presence of PAHs (carbon base compounds) was detected in soils, PCBs will attach to the organic materials and react with PAHs in large volumes (Backhun, 1988 and US EPA, 1989F). While the residential Action Levels for PCB in soil is 1ppm and the Industrial Action Level is between 10 and 25ppm (EPA, 2005). Part of the Anniston Site is located within the Snow Creek 100 year floodplains and is composed of residential and industrial properties. The TA recommends that all residential properties be cleaned-up to <1pp of PCB concentration in soil, regardless of whether the concentration is the residual soil, as stated in the Residential Remedial Alternative in this report. The EPA remedial PRG for industrial is between 10 and 25 ppm; however, Snow Creek's 100 year Floodplain consists of industrial and residential properties and adjoining industrial and residential properties. Before a Remedial Alternative is selected for the nonresidential properties, the PRG must be established first and determination of what the PRG's value is based on must be established, especially when you have adjoining properties with no fencing. The TA recommends that the EPA consider:

- a PRG of ≤9ppm based on nonresidential properties adjoining residential properties,
- children playing on these properties, and
- The lack of fencing to secure access to industrial properties.

By choosing a Remedial Alternative, the TA agrees that complete removal of PCBs would provide the most effective option for addressing PCBs and the associated pathways of exposure, and would eliminate leaching of PCBs into Snow Creek and

groundwater. Also a review of the Toxic Substance Control Act (TACA), PCB regulations call for PCBs to be disposed of in approved landfills and not located in floodplain areas (EPA Hudson River ROD, 1982). The TA also had to evaluate what impact there would be on removal of the PCBs from the floodplain such as:

- Long term effect would eliminate O&M
- Short term effect would most likely increase PCBs being released in the air
- Trucks traveling in residential areas disrupting normal activities
- Erosion and re-suspension of PCBs into Snow Creek would also increase during removal operation
- Re-sampling of properties downstream would be required to evaluate new levels of suspended PCBs in stream.

The TA looked at just adding a cap to the existing floodplain sediment:

- The flood stage of Snow Creek would or could cause flooding of properties which may impact the value of some properties.
- Scouring of the cap is always a possibility during heavy flooding and could impact PCB soils and cause recontamination of properties downstream.
- Even if a cap is selected as the alternative, the contact between the base rock and sediment will not stop ground water from coming in contact with the bottom portion of the PCB sediments. During flooding, groundwater will migrate through the sediment and leaching will still occur (EPA Hudson River ROD, 1982).